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# Canadian Newsprint Exports Up in February

## Newsprint Shipments From Canada Show Substantial Gain For Second Month of Year Over Same Period Last Year—Hearst Accounts Again In Limelight—Machinery Euipment Orders Lower—Other Industrial News.

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., March 20, 1939—Canada's exports of newsprint in February showed a substantial increase as compared with the exports in the same month last year. They amounted to $3,048,730 cwt., valued at $6,533,514, as against 2,794,689 cwt., valued at $5,964,499 in February, 1938. Canada's fiscal year closes on the 31st of the present month. For the first 11 months of the fiscal year—that is, up to the end of February—the exports of newsprint totalled $45,154,864 cwt., valued at $97,972,150, as compared with 59,741,216 cwt., valued at $111,322,213 in the first 11 months of the previous fiscal year—a decrease of 14,586,352 cwt. in quantity and of $13,350,063 in value.

### Hearst Accounts Again in Limelight

The Hearst accounts have again come to the fore in connection with the affairs of Canadian newsprint manufacturers. At a meeting of the directors of the Lake St. John Pulp and Paper Company, Limited, it was decided to omit payment of April 1st interest on the 5 per cent debentures of the company. In making the announcement the directors said:

"Net earnings plus previously earned surplus were in excess of $176,375, the amount of the debenture interest for the year ended December 31, 1938. After considering the current position of the company, however, the directors felt that due to the status of the Hearst account and the large amount owing from that source, the company's liquid position as defined in its debenture trust deed was not such as to permit payment of the debenture interest at the present time."

The Consolidated Paper Corporation, Limited, in its annual report, issued this week, stated that, "At the end of the year the Hearst Companies were indebted to the Corporation for an amount of $1,839,074, which sum comprises $1,623,819 which is represented by notes under discount with our bankers and $215,255 which is included in "Accounts and Bills Receivable. This indebtedness, in the opinion of counsel, is secured along with indebtedness to other Paper suppliers and others, on various Hearst assets which have been pledged or charged to a corporate trustee in New York, in trust for this Corporation and other creditors concerned. The security so provided is of such character that no estimate of its realizable value can be made at this time."

### Paper Machinery Orders Decline

Explaining a falling off in the business of the Dominion Engineering Company of Montreal during 1938, the president W. F. Angus, in the company's annual report, attributes this partly to lack of orders from paper making concerns. He says:

"This reduction (in the general business of the company, was most marked in the paper machinery department, no new paper-making machines having been purchased by the paper industry in Canada during the year, while sales of miscellaneous equipment and repairs to the mills were somewhat less than 20 per cent of their similar purchases from this department during the previous year. It is hoped that the improving prospects for the pulp and paper industry will continue and will be reflected in increased business for this important department of the company.

"The hydraulic department recorded an increase in business booked, including a contract to supply a number of large pumps and valve equipment for the new Victoria Park pumping station in Toronto, and a contract for the supply of four 44,500 h.p. hydraulic turbines for the La Tuque Development of the St. Maurice Power Corporation."

It may be noted that the company carrying out the power development at the La Tuque is jointly owned by the Brown Corporation, well known manufacturers of pulp and allied products, and the Shawinigan Water and Power Company.

### Australian Editor Dies on Visit

Harold Burston, managing director of the Adelaide News in Adelaide, South Australia, died suddenly during the past week at the home here of Charles Vining, president of the Newsprint Association of Canada. Mr. Burston had been in ill health since last autumn, and on the advice of his physician was making an extended trip. Accompanied by his wife, he arrived in Montreal by motor recently after visiting Miami, Chicago and New York. After closing a business deal, Mr. Burston and Mr. Vining had gone to the latter's home. Medical aid was summoned when Mr. Burston collapsed and death was attributed to a cerebral hemorrhage caused by high blood pressure.

# Wausau, Wis. Pays Tribute to Paper Mills

## In Celebrating the City's 100th Anniversary This Year Wausau Pays Tribute To Part Paper Industry Has Contributed To Its Development — Will of M. A. Wertheimer Probated — Power Plan Called Unsound.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., March 20, 1939—Tribute to the part the paper industry has had in building up Wausau, Wis., and vicinity industrially is featured in connection with the city's 100th anniversary, being celebrated this year.

Starting with a capital of $750,000 in 1909, the Marathon Paper Mills Company at Rothschild, Wis., headed by D. Clark Everest as president, is pointed out as one of the established leaders. Although portions of its dams and plants were wrecked by Wisconsin River floods in its earlier years, capital was forthcoming to rebuild. The firm pioneered in the field of finding new uses for paper, and has been in the forefront in developments in the specialty field.

Today the company's total capitalization is $6,200,000, consisting of 200,000 shares of $25 par value common stock and 12,000 shares of $100 par value preferred stock. The book value of the company is estimated at $13,000,000.

Some years ago, the company branched out into the converting field, and now operates a carton and wrapping plant of large size at Menasha, Wis., a tissue mill at Ashland, Wis., and a carton and container plant at Wausau, Wis., using largely products of the Rothschild mill. Its payroll for the last fiscal year was $3,616,303.

### Tribute Paid to Other Leading Mills

The Mosinee Paper Mills Company, Mosinee, Wis., is another mill to which national leadership is attributed. Organized in the early part of 1910, it was the first complete sulphate pulp and paper mill in the United States, then known as the Wausau Sulphate Fibre Company. It was practically the first to install a paper machine for the manufacture of kraft paper, using the process introduced by Olai-Bache-Wilg, who personally worked with the founders, Neal Brown, Louis Dessert, G. D. Jones, Karl Mathie, B. F. McMillan and F. P. Stone, to establish the new mill.

This company was the first in the business to attempt mill branding in the coarse paper industry. Basic weight and testing point became a standard for the industry in the entire United States.

### Mosinee Mills a Self-Contained Unit

Today Mosinee Paper Mills Company is a self-contained unit, controlling its raw products through large timber holdings, owning its own hydraulic power station and having sufficient steam generating units for development of additional power for operation of its mill. The company has kept pace with modern facilities, and has pioneered with installations which are unique in the industry in efficiency and low cost operation.

From a start of 25 to 30 tons of production daily, the mill now exceeds 100 tons a day, and its year's output is approximately 32,000 tons. There are 450 employes on the payroll. Wrappings, towelling, gumming paper and wrapping specialties for packing and shipping are among its principal products. Its Bay West division at Green Bay, Wis., has built up a large converting output, featuring the well-known Mosinee towel.

### Wausau Mills First on Wisconsin River

Tribute also is paid to the Wausau Paper Mills Company at Brokaw, Wis., which was undaunted by a $750,000 loss in May, 1938, when its hydro-electric plant and a portion of its dam were toppled into the Wisconsin River. The directors made temporary arrangements to keep the mill operating, and are about to embark on plans for rebuilding the ruined structure.

Established in 1899, this was the first paper mill on the Wisconsin River, and manufactured cheap white wrapping paper. In 1935 a new management assumed charge and a total of 303 major changes were instituted in renovating buildings and machinery and installing equipment.

Construction of a filtration system took place in 1936, to give the mill 5,000,000 gallons of pure water per day. In late 1936 and in 1937, the boiler room was rebuilt and two new boilers were installed, and the woodroom also was rebuilt and equipped with modern machinery. A new digester system was installed in 1938. A complete slushing system also was added.

These changes enabled the mill to shift over to finer grades of bonds, offsets and lithographing papers, which are now enjoying an extensive market.

### Murray Co. Developed Many Paper Products

Likewise the D. J. Murray Manufacturing Company of Wausau, Wis., comes in for its share of credit for industrial growth. It has developed many products for the paper industry and water power use. Among these are the Murray gate hoists, automatic shut-off valves, drum barkers, automatic loaders for stoker hoppers, the Murray heading machine, spray wheel and others.

### Proposed Power Plan Called Unsound

Proposed hydro-electric developments on the Wisconsin River estimated to cost $26,000,000 were declared unsound by Clayton H. Ward, consulting engineer of Madison, Wis., at a recent state engineering conference held at Milwaukee, Wis. His findings are based on a survey made recently on behalf of interested utilities.

Mr. Ward's estimate is that 116,945,000 kilowatt hours of constant power could be developed annually from the project, whereas the petition for PWA loans and grants cited 227,400,000 kilowatt hours. None of the power from the Big and Little Eau Pleine reservoirs could be classed as constant, he said, and that the unit cost of power from these sources would be 7.3 mills per kilowatt, excluding

*(Continued on page 31)*

# Chicago Optimistic At Better Trade Outlook

## Firm Market and Growing Strength In Many Lines Renews Confidence of Paper Merchants In Future—Paper Trade Opposes State Trucking Bill — Waste Paper Institute Holds Two-Day Meeting — Golf Outings.

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., March 20, 1939—The local paper trade moved in a narrow trend during the past six days showing indications of a strong undertone and continuing to exhibit marked optimism over the immediate future. It is rumored that a marked strengthening in certain lines may take place before many days are past. Meanwhile demand continues to be fair in all lines with the general market structure firm. Krafts report a good volume of business with orders increasing in size. Groundwoods remained in a favorable position while newsprint reports were also encouraging. Book papers are having no reported difficulty in maintaining the improvement registered a few weeks ago while covers are also quoted as in a fundamentally stronger position. Bonds and ledgers likewise noted fair volume and a strong basic market structure. Waste papers continued firm in nearly all grades. Expected declines in folded news did not occur and the condition of other grades was reported as favorable.

### Paper Trade Opposes Trucking Bill

Strong opposition to the Illinois Trucking bill developed at hearings on this massive piece of legislation at Springfield this week. The measure, Senate Bill 93, would have a direct effect on the truck transportation facilities of paper firms in Illinois, not only in the making of deliveries but likewise in the receiving of paper from the mills by truck. Those who opposed the measure called them discriminatory and of the type to "run established and reliable trucking concerns out of business". Inasmuch as the measure includes many provisions designed to administer rate and insure regulation provisions which would reportedly duplicate activities of the Illinois commerce commission, this factor was a target for verbal attacks from many who were heard. Others said that if the law went into effect they would purchase their own trucks because they did not wish to file papers relative to shipments to customers with a public office, where they might be open to competitors.

### Frampton Goes to North American Corp.

From downstate Illinois comes the news that F. D. Frampton, for ten years vice-president and general manager of the Hopper Paper Company at Taylorville, Illinois, has recently been appointed manager in charge of operations of the North American Pulp and Paper Corporation at Cheboygan, Michigan. The North American corporation is a widely known producer of bond, book, offset and tissues.

### Waste Paper Institute Holds Meetings

The attention of the waste paper industry is now focused on meetings of the Waste Paper Institute to be held in Chicago March 20 to 22. The Institute, a division of the National Association of Waste Material Dealers, Inc., is making a special appeal to interest the attention of paper manufacturers in the various sessions. Of particular importance is the meeting scheduled for Wednesday morning, March 22, when one of the speakers will reveal the results of experiments recently carried on at Pittsburg when the daily papers there printed part of their editions on news print paper make from de-inked waste papers. The speaker, Dr. Hochstetter, will bring information on the development of de-inked paper which is considered to be of primary importance to the future of the waste paper industry. Special invitations have been extended to paper and pulp authorities as well as to paper manufacturers to attend this and other sessions of the Waste Paper Institute.

### S.A.P.I. Plan Five Golf Outings

The midwest division of the Salesmens' Association of the Paper Industry utilized virtually all of its Monday, March 13, sessions to discuss plans for the five golf outings which constitute the popular "summer entertainment season". George Crafts, golf chairman, solicited the views of the members as to the type of clubs to be used and as to the general program. It is reported that courses on a par with those patronized in the past are likely to again be favored in 1939 with Olympia Fields under consideration again as the wind-up spot for the outing in conjunction with the Fall meetings of the National Paper Trade Association.

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## Must Pay Higher Duty On Kraft

At least a temporary check has been given the efforts of importers to secure a low dutiable value on kraft paper according to a report by Warren B. Bullock, manager of the Import Committee. The law provides that the dutiable value shall be either the home or export value whichever is the higher. A test case involving an appeal against the Government's action in appraising at the higher home value, shipments in five years beginning in 1931, has been ordered dismissed by an appellate division of the United States Customs Court. The judge who originally tried the case decided that inasmuch as the market for kraft paper in Sweden was controlled because of a restriction on the resale price it could not be taken as a basis for duty and held the paper to be dutiable at the actual sale or export price, about one cent per pound lower than the Swedish market price. The higher court held that the importer had not established that his purchase price was the export price as defined by law. On the basis of this technical decision, the case is ordered dismissed, and the importers must initiate an entirely new case if they wish to carry on their efforts to secure low duty rates. It will probably take two years to carry a new case through the courts, and meanwhile the importers must actually pay duty on the higher value, trusting to an eventual favorable decision to recover what they claim to be an excessive payment.

# Premier Hepburn Approves Sale of Abitibi

## Ripley Committee Plan To Put Assets of Abitibi Power & Paper Co. Up For Sale Favored By Government—Receiver of Lake Sulphite Pulp Co. Now Advertising For Bids To Purchase Property — Other Late News.

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., March 20, 1939—Like the European outlook matters affecting the Abitibi Power & Paper Company Limited, are changing almost daily and new rumors crop up constantly. The situation has been discussed warmly in the Ontario legislature. Premier Hepburn indicated government approval of the scheme of the Ripley committee to put the assets of the company up for sale, giving shareholders an opportunity of redeeming their equity within three years. There was an attack on this action by opposition leaders and a demand that all letters, documents, agreements and other papers concerned in this case since January 1, 1937 should be produced in the Legislature. The Ripley committee has not yet completed details of a new plan.

Announcement is now being made of the formation of a special committee to protect the interest of the holders of preferred stock. It is understood that for some time past members of this committee have been carefully studying the history of the preferred shares with a view to ascertaining their rights and it is expected that a communication will go forward to the preferred shareholders in the near future. The chairman of the committee is D. H. Gibson, President of the Toronto Board of Trade.

### Bondholders Committee Still Functioning

Sir Henry Drayton, chairman of the Bondholders Defensive Committee, when asked if there was any truth in the rumors that the Bondholders Defensive Committee would be disbanded, said that he knew nothing of such intention. He added "I have heard it said as well that we are not in favor of the Ripley plan and we know nothing about that. We have no Ripley plan before us and naturally we can not make any statement as to what we will do until we have that plan and have time to study it in all its implications. The events of the past year have shown that we were perfectly right in opposing the former plan of the Bondholders Representative Committee, usually known as the Ripley committee. They wanted to issue prior mortgages of fourteen million dollars and if they had done so there would have to be a new reorganization today in favor of those prior bondholders. Press reports would indicate that the new Ripley plan still has provision for a prior lien. We did not want it then and we do not want it now. As to the other features I must withhold judgment until I see the plan". Sir Henry Drayon denied the reports that there had been any resignations from the Bondholders Defensive Committee.

### Protective Committee Has Good Backing

It is understood that the Bondholders Productive Committee have been actively canvassing various bondholders groups and that they have succeeded in gaining a backing of more than fifty per cent of bonds outstanding. It is said that, after assets pass to bondholders, certificates of beneficial interest will be issued to them in lieu of 1,930,680 shares which will be held in escrow until July 1, 1942. In the interval shareholders and unsecured creditors having lost all interest in the property will be allowed to buy the said shares or any part of them at $36 a share. The purchase of all the stock would thus place in the hands of the trustee practically the full amount owing to bondholders now. The proposal, it is understood, will permit unsecured creditors to purchase 16 per cent of the stock in escrow, 7 per cent preferred shareholders 6 per cent, 6 per cent shareholders 72 per cent and common shareholders 6 per cent.

It is said that the Ripley committee is adopting a policy of conferring verbally with as many of the shareholders and bondholders representatives as is possible rather than circulating any printed cut and dried proposal. For this reason details of the plan are not yet crystallized and various proposals as to minor adjustments are being examined thoroughly.

### Receiver Would Sell Lake Sulphite Co.

George S. Currie receiver and manager of the Lake Sulphite Pulp Company, Limited, is now advertising for proposals for the purchase of the undertaking, property and assets of the company at Red Rock, Ont. Offers will be received up to April 17 next. The assets consist of 120,000 cords of pulpwood, and cutting rights on 2,200 square miles of timber in the Thunder Bay district as well as the land at Red Rock and Nipogon, Ont. There are also included the incomplete mill buildings, townsite development, hotel, lodges, camps, supplies, etc., and all the issued capital stock of Nipigon Corporation which owns a ground wood pulp mill at Nipigon and has cutting rights from the Ontario government covering an area of 1,400 square miles adjacent to the limits of Lake Sulphite. It is said that an offer will likely be made through one of the trust companies for the assets. The view is now taken that the outlook in the high grade pulp market is such as to warrant an early start in re-establishing the property. For a time after the financial collapse of the enterprise a little over a year ago, it was hoped that an internal reorganization could be carried out but the recent action seems to indicate that this plan has gone by the boards. In the Ontario Legislature last week, Hon. Peter Heenan, Minister of Lands and Forests for the province, said that negotiations with persons "very close to the British government" had been reported to his department.

### Expects Better Demand for Peeled Wood

C. W. Cox, Mayor of Port Arthur, Ont., who is a leading pulpwood operator, returned lately from Rochester, Wis., where he spent a month undergoing an operation of plastic surgery. He says that a revival of the pulp and paper industry in the United States will result in a demand for sap peeled wood from Thunder Bay this summer. It was as yet too early to predict how extensive would be the cut.

# Study Course Features Practical Methods

## Paper Trade Association of Philadelphia Announce Second Half of Paper Salesmen's Study Course Will Start March 28 — Demonstrations Cover Everyday Problems — Paper and Cordage Association Meets.

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., March 20, 1939—Announcement is made this week by Doris E. Lewis, executive secretary of the Paper Trade Association of Philadelphia, of the program for the remaining lectures in this year's series of the Paper Salesmen's Study Course. The 1939 Course, consisting of 10 demonstrations entitled "Sell More—Earn More" was well named. Thus far, the meetings have been given to talking pictures illustrating vital, everyday sales-problems, together with the solutions, and then the interpretation of the solutions in terms of paper selling.

### Second Series Starts March 28

The lecture for the second half of the series are scheduled as follows: March 28th, F. K. Doscher, Sales Promotion Manager, Lily-Tulip Cup Corporation, who will speak on "Personal Salesmanship"; April 11th, G. A. Heintzmann, Specialist, Dexter Folder Company, whose subject will be "Printing Processes and How They Affect Selling Paper, and Today's Problems That Stump the Paper Salesmen"; April 25th, Ellis A. Frampton, Advertising Manager and assistant general sales manager, Hammermill Paper Company, who will present "Fundamental Aspects of Paper Selling and Where We Fail and How We Can Cure Our Ailments"; May 9th, there will be a sales presentation by members of the staff of the Meade Corporation; May 23d, Irving B. Hexter, publisher of *Paper Progress* will discuss "The Ten Commandments of Selling"; Closing exercises will be held June 6th, with dinner and speakers of national reputation, the details of which will be announced later.

H. L. Leatherman of the Thos. W. Price Company, has been elected to the Educational Committee to serve in the capacity of representative for the salesmen enrolled in the study course.

### Sales Clinic to Discuss Selling Problems

The Sales Clinic will be organized and conducted each night, material is to be furnished by the salesmen in the form of problems or questions, and with the help of a capable counsellor and the best paper experience obtainable the answers will be as complete and as factual as it is possible to make them.

The meeting which was scheduled for March 14th, was cancelled in order to provide necessary time to organize the Sales Clinic and to get the problems and questions of the salesmen in hand so that the counsellor can provide answers that are intelligent and factual, and based on actual experience. No further use will be made of the sound films except those such as U. S. Envelope Company, Hammermill Paper Company, and other mills as are available, and will be shown as extras.

### Paper and Cordage Association Meet

The March luncheon meeting of the Philadelphia Paper & Cordage Association, held at noon in Friday, March 17th in the Hotel Adelphia, was somewhat unusual not only because it was held on St. Patrick's Day with James J. Reilley as speaker, but because it was unprecedented from the standpoint of attendance and election of new members. Howard Satterthwaite, chairman of the Membership Committee, welcomed the following firms into membership: Henle Wax Paper Manufacturing Company, Bronx, New York; A. P. Little, Inc., 1335 Real Estate Trust Bldg., represented by D. Wright Yokel; H. M. Gifford Manufacturing Company, Philadelphia; Little Falls Paper Manufacturing Company, Newburgh, N. Y., and Groveton Paper Company, Groveton, N. H.

### President Howarth Explains "Buyers Guide"

President Jack Howarth previewed the Buyers' Guide and Directory, which is now being distributed by the Association. In commenting, President Howarth said: "In the Paper Trade Association there is a Blue Book and a Green Book. Both of these books are very valuable when properly used. In the Philadelphia Paper & Cordage Association we have the Gold Book. Why do we refer to it as the Gold Book . . . because the organizers of this Association inculcated a spirit which is more valuable than any material possession. It is with pride that we remind you of those high ideals upon which this Association was founded. They are: Principles of Honesty and Fairness. All of the activities, all of the teachings of your Association can be summed up in practicing the Golden Rule. Certainly the atmosphere of this Association is the reflection of the determination to play fair, and render a service to mankind. Because of this warm feeling and consideration of the welfare of our members, this Gold Book was created. How shall we use it? Each member should read it over, study it carefully, learn the possibilities, then go to his purchasing agent and prove to him by making this book applicable to his business, outstanding advantages will accrue that have hitherto been unknown.

### Speaks on Value of Association Work

President Howarth then introduced the speaker, James J. Reilley, former president of the Philadelphia Food Brokers' Association, and retiring president of the National Food Manufacturers' Association. Mr. Reilley spoke on the value of Association work and said that whatever personal success he had attained was due solely to his long-time interest in association work.

### Sam Shryock Given Hearty Welcome

Present at the luncheon was Sam Shryock, who was given a rousing reception by all those present. Last September, Sam was stricken while making his rounds among the paper houses, and on account of the serious nature of his illness he has been confined to his home. He has, however, recovered, and it is the fond hope of all his friends that he will regularly attend the Association's luncheons, where, before his illness, he was a familiar personage.

# Financial News of Pulp and Paper Industry

## Further Financial Improvement For Consolidated — Dexter Mills To Operate Under Receivership—Sales Increase For Badger Mills—Nashua Gummed Reports Net Profit — Howard Smith Issues Favorable Report.

### NEW YORK STOCK EXCHANGE

High, Low and Last for the Week Ending March 22, 1939

| | High | Low | Last |
|---|---|---|---|
| Armstrong Cork Co. | 47 | 42 | 42⅜ |
| Celotex Corp. | 17¼ | 15 | 15¼ |
| Celotex Corp., pf. | 72½ | 69 | 71 |
| Certain-Teed Products Corp. | 11 | 8¾ | 9 |
| Certain-Teed Products Corp., pf. | 43½ | 38⅛ | 38⅛ |
| Champion Paper & Fibre Co. | 26 | 24 | 24 |
| Champion Paper & Fibre Co., pf. | 102 | 101½ | 102 |
| Congoleum-Nairn Co. | 27½ | 24⅛ | 24⅛ |
| Container Corp. of America | 15 | 12⅞ | 13 |
| Continental-Diamond Fibre Co. | 7¾ | 6½ | 6½ |
| Crown-Zellerbach Co. | 13½ | 11⅜ | 11⅜ |
| Crown-Zellerbach Co., pf. | 86 | 84⅞ | 85¾ |
| Flintkote Co. | 28¼ | 23½ | 24 |
| Robert Gair | 3⅜ | 3 | 3⅛ |
| Robert Gair, pf. | 12⅛ | 10¼ | 10½ |
| International Paper & Power | 11⅞ | 9¾ | 9¾ |
| International Paper & Power, pf. | 43½ | 36¼ | 37 |
| Johns-Manville Corp. | 94 | 85⅜ | 85⅜ |
| Johns-Manville Corp., pf. | 128½ | 126½ | 126½ |
| Kimberly-Clark Corp. | 23⅜ | 23 | 23 |
| MacAndrews & Forbes | 31 | 31 | 31 |
| Masonite Corp. | 53¼ | 46½ | 46½ |
| Mead Corp. | 11½ | 10⅛ | 10¼ |
| Mead Corp., pf. | 68 | 68 | 68 |
| Paraffine Companies, Inc. | 55 | 53 | 53½ |
| Ruberoid Co. | 27¼ | 25 | 25 |
| Scott Paper Co. | 50¼ | 49 | 49 |
| Scott Paper Co., pf. | 117 | 116 | 116 |
| Sutherland Paper Co. | 28¾ | 27⅝ | 28¼ |
| Union Bag & Paper Corp. | 10¾ | 9½ | 9½ |
| United Paperboard Co. | 5¾ | 5⅛ | 5⅛ |
| U. S. Gypsum Co. | 104½ | 93 | 94 |
| U. S. Gypsum Co., pf. | 176 | 176 | 176 |

### NEW YORK CURB EXCHANGE

High, Low and Last for the Week Ending March 22, 1939

| | High | Low | Last |
|---|---|---|---|
| American Box Board Co. | 7½ | 7 | 7 |
| Brown Co., pf. | 15½ | 15½ | 15½ |
| Great Northern Paper | 37¾ | 36¾ | 36¾ |
| St. Regis Paper Co. | 2⅞ | 2¼ | 2⅜ |
| St. Regis Paper Co., pf. | 52 | 52 | 52 |
| Taggart Corp. | 4¼ | 3⅞ | 3⅞ |

## Consolidated Finances Improved

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., March 20, 1939—The seventh annual report of Consolidated Paper Corporation, Limited, shows a further improvement in the financial position of the company, despite reduced sales and earnings due to a general contraction in activity in the pulp and paper industry. The balance sheet at December 31 showed working capital at $4,770,833, as compared with $2,308,856 at the end of 1937. The net income was $3,406,745, as compared with $4,679,220 in 1937. The entire net income was placed at the credit of depreciation reserve. Outstanding changes in the balance sheet include an increase of $1,000,000 in inventories, a decrease of $274,000 in bank loans and a decrease of $840,000 in accounts payable and accrued charges.

Dealing with the outlook at the conclusion of his report, L. J. Belnap, president, finds it impractical to make a reliable forecast of the results of operations for the year 1939. He notes that world conditions are still unsettled. Another factor, he indicates, is that it is not yet possible to appraise the full effect on the business of the corporation of the recent trade treaty between the United States and Canada, "whereby the tariff protection on certain products was reduced."

"Business generally took a downward trend in 1938 and the Paper Companies were no exception. Physical volume (tons) of sales of all pulp and paper products for the year was less than that of the year 1937 by approximately 32%. The decrease in the gross dollar sales was approximately 20%."

"At December 31, 1938, the capital stock of the corporation was held by 17,257 shareholders, as follows: Canada, 13,439, or 78 percent; British Isles, 2,647, or 15 per cent; United States, 890, or 5 per cent; other countries, 281, or 2 per cent. Of those in Canada, 6,331 are in the Province of Quebec, approximately 37 per cent of the total number of shareholders. The average holding is 134 shares. There were 17,343 shareholders at December 31, 1937."

## Orders Operation of Dexter Mill

[FROM OUR REGULAR CORRESPONDENT]

DEXTER, N. Y., March 20, 1939—Federal Court Judge Frank Cooper ordered the operation of the Dexter Sulphite, Pulp and Paper Company under an equity receivership at a hearing held this week on the petition of the Reconstruction Finance Corporation. The appointment of a receiver was delayed, however, when parties to the action were unable to agree upon a man who was willing to take the job. Names suggested to the court for receiver included George W. Sisson, Jr., of Potsdam, Willard S. Gamble, of Watertown, Charles Reeder, of Carthage, and John O'Connell, of Watertown. The decision of Judge Cooper means that manufacturing at the three mills of the company, idle since January, will be resumed shortly and will continue for a trial period of at least three or four months. The court also suggested that conduct of the receivership include filing of reports at least once a month by the receiver indicating the condition of the business; acceptance of an offer of unionized labor at the mills to take a ten per ent cut and perhaps more later on; limitations of salaries and commissions to salesmen to $10,000 a year; selection by the court of a paper mill technical expert to make a survey of the company's equipment and operations and report on the likelihood of its operations being placed on a paying basis.

## Badger Mills Nets $225,145

[FROM OUR REGULAR CORRESPONDENT]

PESHTIGO, Wis., March 20, 1939—Net profits of Badger Paper Mills, Inc., in 1938 amounted to $225,145, as compared with $269,366 for 1937. Earnings were equal to $3.38 per common share after deduction of preferred dividends, compared with $3.61 the previous year.

Net sales totalled $2,610,692, compared with $2,490,165 in the preceding year. Cost of sales were increased, however, from $1,919,895 in 1937 to $2,059,810 in 1938. Gross profit in 1938 was $550,881, against $570,270. Operating profit, after deduction of $233,300 in selling and administrative expenses, was $317,581, compared with $352,264 in 1937, which was after deduction of $218,005 in selling and administrative expenses.

Net income before taxes was $322,973, compared

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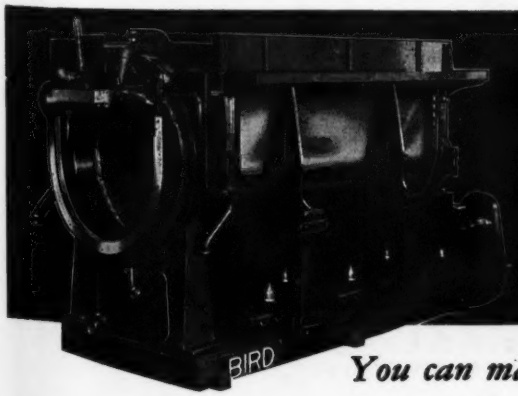
Let us tell you how much dirt we can get out of your sheet . . . Let us tell you what it will cost to do it . . . You tell us if you can do as much for your paper any other way for anything like the same money.

BIRD MACHINE COMPANY, SOUTH WALPOLE, MASS.




BIRD SCREENS

*You can make more money with new Bird Machinery!*

with $341,266 the previous year. Balance in the earned surplus account as of Dec. 31, 1937, was $479,412, and on the same 1938 date was $535,842.

## Nashua Gummed Nets $194,804

BOSTON, Mass., March 20, 1939—Nashua Gummed and Coated Paper Company reports consolidated net profit of $194,804 for 1938, equal to $3.63 a share of common stock, after preferred dividends. In the first nine months 86 cents a share was earned on the common stock. In 1937, earnings amounted to $8.35 a share of common.

Current assets at the close of 1938 totaled $2,579,484, compared with $2,460,830 on Sept. 30, 1938, and $2,646,484 at the end of 1937. Current liabilities were $424,397 on Dec. 31, against $512,966 on Sept. 30 and $476,889 on Dec. 31, 1937.

"The conditions of generally low consumer demand, which began to be felt in the last quarter of 1937, persisted through the greater part of 1938," W. L. Carter, president, observes, "with the result that although a considerable degree of recovery became apparent in the closing months of the year, the sales for 1938 were 15 per cent less that in 1937. Selling prices declined slowly throughout the year."

## Howard Smith Nets $948,231

MONTREAL, Que., March 20, 1939—The financial statement of the Howard Smith Paper Mills for 1938 reveals a moderate reduction in earnings in keeping with the lower level of general business, but a compensating feature is the further substantial improvement in the balance sheet position of the company, as there was effected during the year a reduction of some $938,000 in the aggregate of funded debt and bank loans, and after spending $356,000 on modernization of plant and equipment net working capital at the year-end still showed an increase of $204,000, at $2,763,773. Net profit, after all deductions, was $948,231, compared with $1,126,046 in the previous year. In his comments, Harold Crabtree, president, says: "Your directors find it rather difficult to forecast the outlook for the coming year owing to obscuring factors, amongst which might be mentioned the United States-Canada trade treaty, the effect of which cannot be determined until it has had time to make itself felt."

## W. B. Hadley Heads Detroit Products

At the annual meeting of the stock holders of the Detroit Paper Products Corporation, Walter B. Hadley, production manager of the company's plants at Detroit and Kalamazoo was elected to the board of directors. C. Stanley Sale was re-elected president, Lawrence G. Fell of the Michigan Carton Company, Battle Creek, was named vice president and director, I. E. Mentel, secretary and treasurer, M. E. Erdorfy, vice president and sales manager. Leo E. Thomas of Detroit was also elected to the board.

## Munising Earns $12,742 in 1938

Munising Paper Company reported net profits, after all charges, of $12,742 for the 52-week fiscal year ending Dec. 31, 1938, compared with $157,586 for the year ending Jan. 1, 1938.

## Indianapolis Demand Lacks Snap

[FROM OUR REGULAR CORRESPONDENT]

INDIANAPOLIS, Ind., March 20, 1939—Business during the past week was not so good, according to local paper manufacturers and jobbers. A belated winter struck when everybody seemed to think spring had come and the entire scheme of things was disrupted. Not that there was not so much business done, but the volume was not what the trade felt it should be. It held even with that of the week before when jobbers, particularly, were looking for some increase. The fine paper market was unchanged at a low demand level. However, prices have been well held and in some instances there were incidental price alterations, all toward slightly higher figures.

Most of the makers of building paper and roofing are making plans for the annual "Home Complete" show to be held here shortly. The show has become an institution in the city and at previous sessions the trade reports that some good sales have been made. Building paper retailers are buying carefully, but are keeping their stocks well balanced. At the first hint of real spring they will be in the market in a big way. They are confident this season will see more construction than last and are acting accordingly.

Call for bags and wrapping paper is fair and will increase when the season changes. Kraft prices are held steady. A slight increase was seen in demand for tissues. Box makers and converters report a slight increase. Call from the larger distilleries and breweries of the state is somewhat stronger and there has been a slight increase in demand from a number of small users who have been virtually out of the market since the first of the year. There has been a good demand from makers of automotive equipment and the hardware trade for boxes. The waxed container field also should improve shortly with the ice cream season coming on. Some inquiries have been made for summer specialties, but as yet there has been no actual buying.

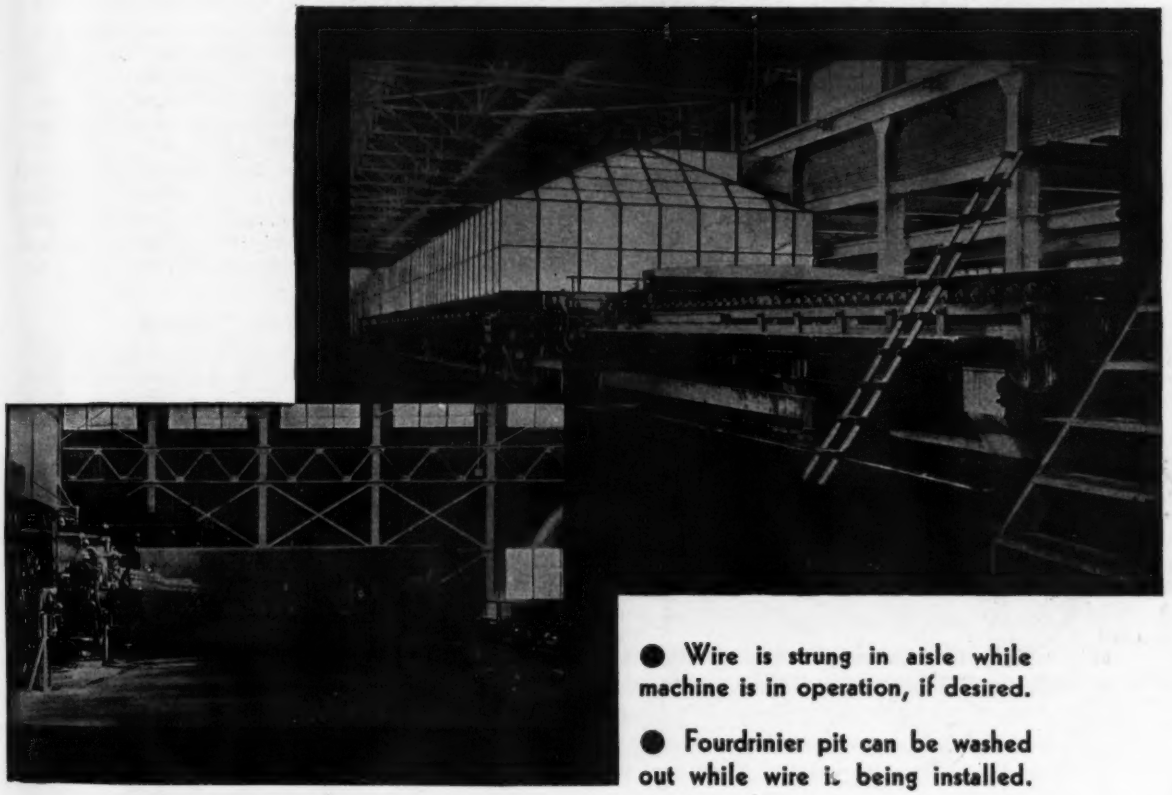
The slight price advances recently on better grade paper stock and rags seems to be holding, but demand is far from satisfactory. Heavy stocks are in local warehouses.

## Chlorine Institute Elects Officers

The Chlorine Institute, Inc., held its annual meeting and directors' meetings on March 10, 1939, at the Chemists' Club, New York, N. Y., when the following directors were elected for two years: N. E. Bartlett, Pennsylvania Salt Manufacturing Company; Thomas Coyle, R. & H. Chemical Department., E. I. duPont deNemours & Co., Inc.; John A. Kienle, The Mathieson Alkali Works, Inc.; Louis Neuberg, Westvaco Chlorine Products Corporation; Eli Winkler, Columbia Alkali Corporation. The hold-over directors are: H. M. Hooker, Hooker Electrochemical Company; S. W. Jacobs, Niagara Alkali Company; E. C. Speiden, Isco Chemical Division of Innis, Speiden & Co.

At a directors' meeting following the Annual Meeting, the officers shown below were elected for the year 1938: S. W. Jacobs, president; E. C. Speiden, vice president; Robert T. Baldwin, secretary and treasurer.

# THE BELOIT *Removable Fourdrinier*



● Wire is strung in aisle while machine is in operation, if desired.

● Fourdrinier pit can be washed out while wire is being installed.

● Wire bundle is taken from shipping box and mounted directly in carriage—no chucks to apply—no further handling as bundle is unreeled as carriage moves along to form wire loop.

● All wire poles are mounted in carriage before loop is formed. Inside poles are inserted inside the wire.

● Safest — most convenient — quickest method of installing Fourdrinier wire.

THE BELOIT WAY IS THE MODERN WAY

BELOIT IRON WORKS PAPER MACHY BELOIT, WIS. U.S.A.

# The Sales Training Program of the Paper Industry

Information upon which the sales training program of the paper industry will be promoted and written will be secured in three ways:

First; approximately forty research investigators will be sent into the field to work with top-flight salesmen of mills converters, and merchants. They will go with and observe, as well as question, the methods employed by these salesmen, staying with each man approximately two or three days. They will have standard questions to ask these men to determine what makes them successful; what they do that sets their work apart from good or mediocre salesmen. For example, they will first find out if he makes money for his own house; if he sells merchandise at a profit—or at cut rate or discount prices. They will observe the percentage of his total line that he sells; what numbers he concentrates upon; his chief stock in trade—whether his house, his own personality or the merchandise that he sells; the information that he has available; the type of answers that he has for his prospects; the samples that he carries and the general intelligence that he displays in handling his accounts.

Second; in addition to the foregoing crew, there will be three men who will travel throughout the country, contacting mills, converters, and merchants, to determine these two factors: (a) what technical information do they pass to their salesmen, (either fine paper or coarse paper) and how do they give this to them; (b) what sales training methods are now being used by these three groups for the benefit of their sales forces, as well as for inside employees. We have already had offers from more than one hundred mills and merchants, offering to give us this full information on their own techniques.

Third; six research men are already at work, gathering information from libraries, private institutions, publications, and private writers, on all technical subjects pertaining to paper. This information is being catalogued indexed and cross-indexed.

### Assembling of Material

When all of the foregoing information has been gathered it will go to competent writers, most of whom will be chosen from the paper trade. Naturally, there will be more than a hundred times as much information as will be needed. This will be sorted, sifted, and winnowed, to obtain the concentrated formula of success which we expect to pass to those who take this training. It will be prepared into three separate divisions, which will be passed to the enrollees under the following headings:

First; sixteen lessons each will be prepared on fine paper and on coarse paper, outlining the technological features of each line. In addition, forty-eight lessons on the salesmanship of paper and paper products similarly will be prepared which will be common to each of the foregoing lines. This will be given to the salesmen in a proportion of one technical lesson and three salesmanship lessons per week for a period of sixteen weeks, startng September 5.

The men will enroll for either the coarse paper or the fine paper courses, at the instance of their employer. Their employer may also enroll them for both courses, at no additional cost if this is desired.

### Supplementary Material for Veterans and Cubs

Those men with years of experience, who indicate they have ability beyond the average, will be given additional supplemental material. In this classification, will come those who probably have had ten, fifteen or more years of high sales performance.

Similarly, those beginners or "cubs," for whom the lessons would seem a bit difficult, supplemental material will be given of a simpler nature to help introduce the subject by more gradual stages. No additional charge will be made for this service.

### Company Group Training

The second phase of the men's training consists of group meetings under the guidance of a man appointed within their own organization. This usually will be the sales manager or some other competent individual who will hold bi-weekly group meetings. This sales manager will be provided with a sales manual which will help him to review the lessons taught during the preceding two weeks. Moreover, it will also help him to apply those lessons to the products sold by his particular organization and interpret them into the language and policies of his company.

To help him in the above work, he will be supplied with a sound slide film which will help dramatize and visualize those lessons which were taught the previous two weeks. There will be eight such manuals and eight sound slide films during the sales training period.

In the case of mill representatives who obviously cannot return to their own organizations for these meetings, they are supplied with cards which will give them entree into the meetings of other organizations in territories where they might happen to be. (Of course, they must secure permission from the organization in question but this should not be difficult in the case of one of their distributors.)

As a rule sales training programs of this nature employ only one of the two foregoing methods and consider that sufficient. This program employs not only both of these methods, but also another feature which has only recently been developed by the man who has basic charge of the educational features of this program—Dr. S. N. Stevens, Dean of the University College of Northwestern University, who is also Director of Education of the Industrial Training Corporation.

The Industrial Training Corporation is an AAA-1 educational institution, which has been

# Highest Packaging Honors to BAGPAK ROSIN BAGS

☆

**The Judges of the 1938 All-America Packaging Competition, who comprise the top flight of Packaging Engineers, were quick to realize the utility and serviceability of a correctly designed paper bag as a bulk shipping container for one hundred pounds of Rosin. Consequently they bestowed upon a Bagpak paper bag, entered in competition with hundreds of more expensive rigid containers, the very highest honors in their power to grant—THE TOP AWARD! We believe this fact warrants the serious consideration of all Rosin consumers, and if you are not familiar with this new and improved type of Rosin container, we suggest you try them on your next order.**

*All grades of Rosin can now be obtained in these fine new containers from the following companies:*

**GUM ROSIN**

The Rosa Company
Homerville, Georgia

Turpentine & Rosin Factors, Inc.,
Savannah, Georgia

The Glidden Company
Nelio Rosin Division
Jacksonville, Florida

**WOOD ROSIN**

Hercules Powder Co.
Naval Stores Division
Wilmington, Delaware

Newport Industries, Inc.
New York, N. Y.

"One-man package... easy to handle"

BAGPAK INC

☆ Trade Mark reg. U. S. Pat. Off.

220 EAST 42nd ST. NEW YORK CITY

operating continuously since 1916. During that time it has graduated more than 40,000 persons. Its record of success in the field of vocational training has been definitely established over the past 22 years. They are preparing this program and will co-ordinate and conduct it for us.

### A Three-Day Personal Sales Clinic

Third; when the enrollee has completed the two foregoing portions of our sales training program, he will then attend a three day sales clinic which is to be held in the strategic centers throughout the country. Fifty to sixty men will attend at a time and it is planned to hold them in such cities so that no one will have to travel more than 300 miles.

At these clinics there will be, first of all, feature length motion talking pictures on paper and paper subjects; also on selling paper items. There will be live actors who will demonstrate the sales lessons taught in the sales program; there will be lectures on technical and selling problems; and finally, there will be participation by the individuals who attend.

### Sixteen in Each Clinic

There will be approximately sixteen individuals in each clinic who will have charge of the instructional work. Many of these individuals are to be drafted from the paper industry, from organizations who will release their services for the period demanded for this sales training program. They will, in every instance, be chosen for their sales and technical knowledge, as well as for their ability to impart this knowledge to others.

### Cost of Program

While the tuition per man for the program has been definitely set at $85.00, the final cost has not yet been determined. This will depend upon how much of an underwriting fund is raised by the mills. The first 2,000 enrollees will participate pro rata. For instance, if the fund being raised amounts to $20,000, there will be passed on for each enrollee a saving of $10; if the fund is $40,000, it means a saving of $20 per man, etc.

The cost of training the salesman, it is suggested, is to be divided equally between the organization and the salesman, after he has completed the training. It is felt that this will be an additional incentive to the salesman to finish the training.

This is wholly an altruistic movement on the part of the Paper and Twine Club. Not a single officer nor member of the club will make any profit whatsoever, nor even expenses, for their efforts in sponsoring this sales training program. This is, of course, as it should be, for the true motive of the club is to be of service to the paper industry.

### Board of Governors

The entire program differs from anything ever done before in this field by being entirely of the industry, by the industry, and for the industry.

The development of our program, and its complete administration, will be under the direction of a board of governors, headed by Clark Everest, president of the American Paper and Pulp Association. In addition to Mr. Everest, there will be two other mill executives, and at least three well known merchants. One of these merchants, already selected, is R. W. Miller, vice president of Central Ohio Paper Company, Columbus, Ohio. This board will meet once per month to supervise and direct every phase of the program.

### Those Who Are Eligible

Any owner or employee of any organization manufacturing or selling paper or paper products is eligible to enroll in the sales training program of the paper industry. There are four groups in this classification, which may be itemized as follows: First, Owners and managing executives; second, Senior salesmen; third, Junior salesmen; fourth, Other elegible employees including (a) "Inside" sales and advertising staffs (b) Order Department employees (c) Sample room personnel and (d) Young men "on their way up."

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## Scott Paper Co. Busy

"Orders booked during January and February by the Scott Paper Company of Chester, Pa., continued at the same high level that obtained during 1938 and were considerably in excess of the company's ability to produce," Thomas B. McCabe, president of the company stated on releasing the "Stockholders News" to shareholders of the company.

"The $2,500,000 Chester plant expansion program announced in August, 1938, is rapidly nearing completion and production interruptions to the other equipment and the abnormally high costs incident to this program are being gradually reduced. Plant operations are being maintained on a regular 24 hour, seven-day week basis as in 1938, when the company reached a new high level in sales, earnings and production.

Mr. McCabe further stated that on a comparative basis, he did not think the first quarter of this year would be as favorable as some subsequent quarters.

"More employees of the company are now participating in the Employees' Stock Purchase Fund than at any time since the fund was started eleven years ago. At the present time 62 per cent of the employees are shareholders," Mr. McCabe said.

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## Large Pulpwood Stands in Louisiana

The South Louisiana Delta has the largest concentration of tupelo gum pulpwood in the South, it was revealed in a report released each week by the Forest Survey of the South, an activity of the Southern forest experiment station here.

E. L. Demmon, director of the station, said that the species is suitable for the manufacture of newsprint and other white paper, which he described as products of great potential value to the South in its expanding program of industrialization.

The survey, compiled under the direction of R. K. Winters of the staff of the Southern Forest Survey, concluded that "the opportunity for developing excellent stands of fast-growing hardwood trees, along with the favorable locations for future markets, indicates that the management of privately owned forest land for continuous crops of timber has excellent chances for success."

MORE PLANT EXECUTIVES ARE ASKING THIS QUESTION EVERY DAY

# "Can WE make further operating savings through *improved lubrication?*"

## *An experienced* GULF *engineer will help* YOU *find the answer . . .*

"WHEN our management demanded a further reduction in operating expense, we decided the saving had to come from maintenance costs," says this plant superintendent. "So we called in the Gulf engineer—and he is helping us secure the economies we need."

Scores of plant managers are reducing their operating expenses every day through improved lubrication with Gulf's *higher quality* oils and greases. The Gulf engineer is a thoroughly trained and widely experienced lubrication expert who has the knack of working tactfully with operating men. Because he knows what type of lubricants best provide for the conditions under which machines must work, he is prepared to recommend the proper application of oils and greases which contribute most to efficient machine operation.

With friction and wear reduced to a minimum, power bills come down and maintenance expense is reduced. After Gulf's higher quality lubricants are placed in service, it is not uncommon for plant managers to report savings *in maintenance alone* amounting to many times the total annual bill for lubricants.

So we suggest that you ask this question of the Gulf engineer when he calls, "Can we make further operating savings through improved lubrication?" He can help you find the answer. Gulf Oil Corporation—Gulf Refining Company, Gulf Building, Pittsburgh, Pa.

GULF INDUSTRIAL LUBRICATION

# Superintendents Meet at Kalamazoo

KALAMAZOO, Mich., March 20, 1939—The Superintendents Association held its March meeting on the evening of the 16th at the Park American Hotel with fifty present. Following the dinner, chairman Ray Barton made several important announcements, among them being the outline of the program for the annual Ladies' Night Party to be held on Saturday evening April 22, also that the May meeting on the 18th would be "Old Timer's Night" and a life membership would be conferred on at least one of the old members.

### Competitors Speak

The two speakers on the program Fred Stickle, president of the Stickle Steam Specialties Company, and Fred Stamm, of the Stamm Air Relief Control Company—being competitors in their respective products, was an unusual incident. Both addresses, however were handled with diplomacy and proved very interesting with no subject matter overlapping. Mr. Stickle was first up, his subject being "Drying Paper". In his introductory remarks he stated that it was in Kalamazoo that Mr. Cole Stickle first conceived the idea of the individual trap drainage system for drier drainage and at the suggestion of a Kalamazoo paper mill superintendent, later developed and patented the automatic steam control. This trap which Mr. Stickle manufactured, was used extensively for drier drainage and over thirty-four thousand have been installed on paper machines in the United States and Canada.

"I have always felt," Mr. Stickle said, "that the most practical way automatically to control the drying of paper, is by the tension of the sheet as it passes over the driers. You all know that when paper is too dry it contracts and when damp it expands. The principal mission of an automatic steam control is to hold uniformity in dryness and to hold this uniformity you must hold a uniform tension or draw. There is a continuous change taking place in the character of the paper as it passes over the driers. The sheet is changing in weight and the slowness and freeness of the stock is changing.

"If the sheet is calipered as it passes over the driers it will be found that there is a continuous variation in the thickness or small hills and valleys. In order to have close regulation the tension roll must be very sensitive to these changes and the result is that you often get over regulation. For that reason we have designed and perfected the combination of tension and thermal control.

"If the sheet is a little on the heavy side, the tension control starts the operation of opening up the steam valves and letting additional steam to the driers, but there may be only a few feet of paper on the heavy side and immediately following this, is the normal sheet of correct weight.

"The control has admitted additional steam, and the results are that the normal sheet is over dried and the control starts to close off the steam. At this point is where the thermal control becomes effective, when the tension roll starts to increase the steam pressure or temperature the thermal control retards this operation, as the mission of the thermal control is to hold a uniform temperature in the driers and to prevent too great a fluctuation in the flow of steam to the driers a uniform pressure or temperature will not make a uniformly dry sheet of paper and for that reason the temperature control alone is not satisfactory, but the combination of the two controls, one as a break on the other, affects a more uniform dried sheet of paper. In designing this equipment we have tried to keep away from complicated and delicate mechanism.

"Sudden fluctuation in the flow of steam to the driers can cause a great deal of trouble throughout the plant where steam is being extracted from a turbine, and a sudden change in the flow of steam will effect the speed of every motor in the entire plant, or a sudden change of back pressure of an engine will vary the speed of the unit, which in either case will effect the speed of the paper machine, and this in turn will effect the weights of the paper and cause the control to fluctuate or surge, resulting in a variation in the moisture in the finished paper.

"These are some of the problems we have encountered in the controlling of steam to the paper machine, and to meet them, it has been necessary for us to design special equipment to take care of these conditions.

"The savings resulting from uniformity of moisture content of the paper and the savings resulting from not over drying is a factor well worth considering.

"Very recently we equipped a large paper machine, making 150 tons every 24 hours. A check on moisture showed a variation of 5 per cent in the finished product with hand control.

"The average increase in the moisture content with automatic control was 2 per cent bigger than with hand control condensed into dollar value, means that this company is selling three tons of water more to the consumer, at the price they are receiving for their product and which figures a little over $100 per day, and the additional saving of 16000 pounds of steam every twenty-four hours. In addition a much higher grade of paper was produced. Perhaps one of the greatest single causes of variation in drying is poor drier drainage."

### Fred Stamm Speaks

At the conclusion of Mr. Stickle's talk Fred Stamm then took up the subject of Drier Drainage Control. He covered the matter in a well delivered and interesting address and following his talk a lengthy forum took place, both Mr. Stamm and Mr. Stickle answering scores of questions put to them by the superintendent on this very important phase of the industry.

### Those in Attendance

Those present at the meeting were: I. W. Johnston, The Dorr Company, Inc.; F. L. Zellers, National President of the American Pulp and Paper Mill Superintendents Association; M. F. Flotow, French Paper Company; C. "Baldy" Smith, Huron Milling Company; Jess Wright, Meincke Corporation; John

# They LOOK like other table rolls...

**...but seven years of service prove Monel rolls have superior qualities**

*Monel table rolls for Fourdrinier machine producing high grade papers. Rolls made from seamless Monel tubing by the Black-Clawson Co., Hamilton, Ohio.*

**Quality No. 1—NO SAG... NO WHIP**

These Monel rolls are almost *twice* as stiff as other rolls of the same diameter and wall thickness made from the usual non-ferrous metals.

**Why?** Monel has a modulus of elasticity of 26,000,000 p.s.i. whereas the common non-ferrous metals have a modulus of but 14,000,000 to 16,000,000 p.s.i.

**Quality No. 2—SMOOTH, CLEAN SURFACE**

Monel table rolls maintain a smooth surface in operation... do not require expensive cleaning. A high degree of wettability permits free drainage of water and reduces friction between wire and roll.

**Why?** The roll surface is dense and smooth with a hardness of about 180 Brinell (3,000 kg.), and resistant to wear by abrasives in stocks and white water.

Monel rolls are free from dezincification type of corrosion, and resist pitting and corrosion by acid or alkaline white water and wire cleansing solutions.

**MONEL**

"Monel" is a registered trade-mark of The International Nickel Company, Inc., which is applied to a nickel alloy containing approximately two-thirds nickel and one-third copper.

THESE are the principal qualities which account for the excellent service given by Monel table rolls in mills producing high grade Writing, Bond and Mimeograph papers. Seamless Monel tubes are used for rolls up to 5" diameter. Larger diameter Monel table rolls or wire rolls for News Print and other wide machines are made with a steel core and Monel sheet cover by an economical pressure welding process.

Your machine builder can furnish both types of Monel rolls. Write to him for quotation. For the new and enlarged Bulletin C-3 "Monel, Nickel and Inconel in Pulp and Paper Mills" write direct to:

**THE INTERNATIONAL NICKEL COMPANY, INC.**
**67 Wall Street New York, N. Y.**

O. Logan and M. S. Clark, Mathieson Alkali Works; Fred Hodgemire, Hawthorne Paper Company; L. M. Monreig U. S. Rubber Company; R. W. Van Kirk, Pennick & Ford Ltd.; Paul Dumas, Chromium Corporation; B. A. Yule, F. C. Huyck & Sons; O. F. Hutchinson, Bulkley, Dunton Company; Homer E. Stafford, Frank B. Eilers, Orr Felt Company; Fred L. Chappell, Hercules Powder Company; L. H. LeBerte, Robert B. Stewart, Kalamazoo Vegetable Parchment Company; Al Perlick, secretary-treasurer, Mich. Division; F. A. Stickle, Stickle Steam Specialties Company; F. C. Stamm, Lockport, N. Y.; P. L. Ulrich, N. J. Berger, A. E. Armstrong, Armstrong Machine Works; W. K. Kidder, O. F. Fischer and E. C. Rutz, Bryant Paper Company; Arthur Weinland and R. L. Atkins, Lee Paper Company; D. T. Quirk and J. J. Ely, Peninsular Paper Company; A. M. Vanderberg, H. L. Vanderberg, Staley Starch Company; E. G. Milham Watervliet Paper Company; C. R. Pasch, M. R. Wilkins and R. H. Smith, Bryant Paper Company; Henry Nendorf, Harold Heath and A. W. Cole, Rex Paper Company; William Astle, Paul de Guehery, M. S. Fogerty, George C. Schmidt and R. L. Barton, Michigan Paper Company; Glen Sutton, Arnold Weller and Al Sherwood, Sutherland Paper Company.

# New England TAPPI Discusses Food Containers

The New England Section of the Technical Association of the Pulp and Paper Industry met at the Roger Smith Hotel, Holyoke, Mass., on Friday evening, March 17, 1939. Randall H. Doughty presided as Chairman. About sixty were present.

### Sanitary Quality

The first speaker was J. R. Sanborn of the New York State Agricultural Experimental Station, Geneva, N. Y., who talked on "Sanitary Quality in Fabricated Paper." (This paper will be published in full in the PAPER TRADE JOURNAL).

Mr. Sanborn pointed out that reducing the bacteria count in paper making indicated good mill housekeeping and has its advantages from an economic standpoint in reduced lost time, rejected product, etc.

Certain papers require an extremely low bacteria count such as milk and cream containers, surgical tissues and to a less extent papers that come in contact with foods. For milk containers chemical or mechanical pulp is recommended. These pulps are essentially sterile when made but become contaminated as more and more white water is used for washing. By chlorination methods the water can be sterilized.

An interesting rapid-fire discussion followed in which Messrs. Tucker, Kennedy, Rubin, Brakewood and Foote and Miss Kiely participated with the speaker.

### Science and Society

The second speaker was Prof. H. C. Weber of the Massachusetts Institute of Technology who gave a popular presentation of the methods of the Scientific, economic and social philosophies. Dr. Weber pointed out that the scientific method consists of making experiments, correlating results, theorizing thereon, and finally drawing conclusions and testing the results.

The speaker expressed the hope that the same procedure will rapidly come into more general use in the economic and social fields where an open mind and clear thinking are so much needed.

### Those in Attendance

Those present included: W. A. Nivling, Paul A. Donaghy, Jack Dickson, T. J. Flaherty, Henry L. Mellen, R. E. Kilty, T. L. Stirling, C. A. Homan, H. T. Barker, Albert C. Lamoureux, P. S. Bolton, Harold R. Miller, R. F. Irwin, Stanley A. Brunell, J. R. Sanborn, R. H. Doughty, John B. Calkin, C. H. Bergman, J. P. Kennedy, F. H. Lovenberg, L. N. Smith, W. L. Foote, Norman Alper, A. G. Engstrom, R. G. Macdonald, Helen U. Kiely, Lena E. Kelley, James Fitzgerald, Charles Backus, John T. Leecock, E. O. Reed, John McGarry, A. L. Perry, A. F. Bailey, Murray Rubin, A. P. Jackson, S. A. Brown, S. Burdick, W. J. Burke, William Anderson, Harold Brakewood, P. W. Ayers, R. A. Packard, E. C. Tucker, Dr. H. C. Weber, Dwight Bartlett, J. J. Thomas, William Talbot.

## A. J. Allison Dead

Friends of A. J. Allison, a salesman for the Simonds Worden White Company of Dayton, Ohio, were shocked to learn of his sudden death from a heart attack on March 15.

Mr. Allison was on his way to call on a customer and apparently had some warning as he had driven off to the roadside and parked his car. He was found slumped over the steering wheel by two passing autoists who immediately summoned help and before arrival, he had passed away.

He had been connected with the Simonds Worden White Company for a number of years and was well known throughout the Miami Valley district, as well as adjoining states. He was 72 years of age and leaves a wife and one son. His funeral was held in Dayton, Ohio, on Saturday, March 18, with interment in the Woodland cemetery.

## D. M. Bare Puts Out New Lines

[FROM OUR REGULAR CORRESPONDENT]

ROARING SPRING, Penn., March 20, 1939—The D. M. Bare Paper Company has made improvements in manufacturing methods and has put on the market three new lines of paper, all of which are Ruskin Stabilized. The lines are Twin Finish, Egg Shell and Supercalendered. The company has one of the finest water supplies in the country, 8,000,000 gallons a day, the same temperature the year round. This condition is a prominent factor in giving papers a color, finish and formation which are distinctive without diminution of strength. The papers have good working qualities as well.

# Boston Paper Trade Association Meets

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., March 20, 1939—With an attendance of 162, the Fifty-third Anniversary Banquet of the Boston Paper Trade Association took place Wednesday evening at the Algonquin Club. A reception preceded the dinner. The singing of community songs was one of the enlivening features of the affair.

### Hold Annual Meeting

Following the banquet, the annual meeting was held, with Vice-president John L. Hobson presiding. In the absence of Secretary John H. Brewer, F. Bendel Tracy acted as secretary pro tem. The report of Treasurer T. Charles Casey showed the organization in good financial condition. The total membership was announced as 201, which, with the election later of six new members, became 207.

Taps were sounded for those who had passed away during the year: President Walter J. Raybold, F. P. Carpenter, George M. Graves, Willard N. Munroe, Roger B. Taft and Joseph D. Snell.

### New Members Elected

The following new members were elected: Ernest C. Calkin, general mill representative; J. R. Cryan, Fraser Industries, Inc.; Willard N. Munroe, Jr., Groveton Paper Company; Daniel P. Abercrombie, Jr., Brightwater Paper Company; David Cheever, Jr., Hollingsworth & Whitney Company; and Paul E. Hodgdon, Keith Paper Company.

Colonel Charles S. Proctor, chairman of the nominating committee, in presenting the list of officers, all of whom were unanimously elected, spoke in his usual happy vein. The following officers were chosen:

### The New Officers

President, John L. Hobson; 1st vice-president, Robert M. Stone; 2nd vice-president, Irving N. Esleeck; secretary, John H. Brewer; treasurer, T. Charles Casey. Directors—The officers, Norman Harrower, W. Edwin Porter, Jr., and Charles W. Fields. Membership committee—W. N. Stetson, Jr., Royden Loring, Matthew O. Byrne, Willard H. Loud, Hubert W. Lockhart. Arbitration committee—George W. Wheelwright, Arthur L. Hobson, Irving N. Esleeck, Jesse G. Swift, Harry C. Thayer. Auditor—William C. Ross.

Colonel Proctor made special mention of the fact that the new auditor, William C. Ross, was son of a distinguished father, William Ross, who had served as auditor for many years. Mr. Ross, Sr. is now passing the financial responsibility on to his son.

Besides Colonel Proctor, the nominating committee is composed of John E. A. Hussey, John W. Vivian, M. L. Madden and Jesse G. Swift.

It was announced that the summer meeting of the association would be held Monday, June 5, at the Charles River Country Club, lasting all day.

### Vincent Sheehan

Vincent Sheehan, of Prague and Paris, author and correspondent, was speaker of the evening, discussing "Europe after Munich". His talk happened to be given on the same date when Hitler took Bohemia. Mr. Sheehan gave a highly informative and instructive address, with interesting comments. He intimated that Hitler was a bully and would keep on until he met his finish. He described the Fascist government as moving all the time. The speaker noted in connection with Germany, Italy and Japan, that an aggression by one was followed by an aggression by another. He expressed the opinion that Italy thinks Hitler struck out of turn in his latest acquisition. In a very short time, we will hear of some major move by Japan.

Governor Leverett Saltonstall, who was expected to be guest of honor, was unable to attend.

### Those in Attendance

Those present included the following:

D. P. Abercrombie, Jr.; Allen, Harold A.; Allen, Ralph W.; Andrew, George C.; Andrew, John A.; Andrew, John A., Jr.; Andrew, Sumner B.; Ashley, S. Guy; Barr, Harry C.; Bartlett, S. W.; Beach, Paul; Beckett, Ralph G.; Beckwith, R. M.; Bell, Arthur F.; Bigelow, Henry F.; Bliss, Geo. W.; Bostwick, Harold; Bracken, O. T.; Brown, Charles J.; Burke, J. F.; Burr, Arthur M.; Burrell, C. A.; Byrne, Matthew O.; Calkin, E. C.; Carter, A. T.; Campbell, R. H.; Carter, James R. 2nd; Carter, Hubert L.; Case, Ralph B.; Casey, T. Charles; Catharin, N. R.; Chalmers, T. E.; Chase, Howard E.; Cheever, David; Claflin, L. L.; Clark, Nathan S.; Clark, John G.; Collins, Sheldon C.; George E. O. Connor; Crowell, Ashley; Cryan, J. R.; Cummings, E. L.; Cummings, Frank B..

Ralph L. Day; DeCoster, J. C.; Denison, Adna C.; Dixon, J. W.; Donahue, Henry M.; Dwyer, J. J.; Emerson, Gordon E.; Esleeck, Irving N.; Ewing, R. D. H.; Fields, Charles W.; Fowler, H. S.; Frank, Arthur W.; Fraser, Paul B.; Halkyard, John R.; Hall, C. S.; Halloran, J. F.; Ham, H. C.; Harrower, Norman; Harvey C. W.; Harvey, Geo. S.; Hatfield, Allan I.; Hay, Edgar P.; Heuer, H., Jr.; Hobson, Arthur L.; Hobson, John L.; Hodgdon, P. E.; Holmes, Walker B.; Hoss, F. J. L.; Hulett, Lee H.; Humes, Ralph; Hurlburt, H. A.; Hussey, John, E. A.; Ingalls, John P.; Jones, Paul M.

John Kelley; Ketcham, E. E.; Kimball, Norman; Knutson, Carl J.; Korbel, Fred B.; Leinbach, F. S.; Lindenberg, Herbert A.; Little, E. H.; Lockhart, Hubert W.; Lockwood, F. G.; Loring, Royden; Lyman, E. R.; Madden, James L.; Madden, M. L.; Madden, Russell S.; Maglathlin, L. E.; Main, F. W.; Mann, William F.; Masselink, F. H.; May, Fred E.; Mathers, L. R.; McLellan, William J.; Miller, Herman E.; Morrill, Ralph H.; Morrison, George F.; Moses, H. A.; Moses, Kenneth L.; Mosher, George W.; Munroe, J. L.; Munroe, W. H., Jr.; Murray, E. G.

Charles W. Nelson; Newall, Clifford E.; Newton, William W.; O'Brien, Charles J.; O'Brien, J. J.; O'Connor, George E.; O'Neill, R.; Park, Maurice A.; Paterson, N. J.; Perry, David A.; Pierce, Arthur J.; Piper, R. F.; Poeckert, R.; Poore, Leon M.; Porter, W. Edwin, Jr.; Proctor, C. S.; Ran-

som Lennox; Reider, Bert. I.; Rice, C. E.; Roach, John E.; Robbins, Herbert W.; Robinson, Ralph P.; Ross, William; Ross, William C.; Savage, F. Henry; Shaw, Charles A.; Sheean, Vincent; Simpson, E. T.; Smith, F. E.; Stafford, A.; Stetson, W. N., Jr.; Stone, E. H.; Stone, Robert M.; Stuhr, George; Sussenguth, E. H.; Swift, Jesse G.

Royal P. Teele; Thayer, Harry C.; Townsend, C. W.; Tracy, F. Bendel; Very, W. Gardner; Vivian, John W.; Walden, Van Rensselaer; Walpole, William H.; Weems, James N., Jr.; Welch, Robert H.; Wellington, C. Frederick; Wesby Robert; Whitney, J. R.; Willoughby, W. J.; Winter, Frank H.; Wood, E. L.; Wood, Fred L.; Zink, John D.

# Pacific TAPPI Meets at Seattle

The fifth in a series of monthly dinner meetings of the Pacific Section of TAPPI was held March 7 at the Washington Athletic Club, Seattle, with an attendance of 112 making it one of the largest and most successful programs of this season. N. W. Coster, chairman, presided at the dinner and with him at the head table were L. S. McGurdy, vice-president of the American Pulp and Paper Mill Superintendents Association; Anton Siebers, vice-president; Niles Anderson, 2nd vice-president, and A. S. Quinn, treasurer of the American Pulp and Paper Mill Superintendents' Association, and William Webster, vice-chairman and Fred Shaneman, secretary-treasurer of the Pacific Section of TAPPI.

### To Be Convention Manager

Chairman Coster informed the group that G. S. Brazeau had accepted general chairmanship and Tom Bannon agreed to be convention manager, for the 1940 National Meeting in Seattle. Following a brief report by Mr. Coster of his recent trip to New York to attend the National TAPPI meeting, he announced that the joint meeting of the superintendents association and TAPPI would be held June 2 and 3 in Tacoma. The latter city had been chosen following a joint meeting of the executive committees of both organizations.

J. Gordon Adderson, assistant superintendent of Gladding McBean & Company in addressing the group on "Trends and Developments in the Ceramics for Industrial Use" presented some interesting data regarding application of technical principles to the ceramic industry and their influence on manufacturing. With reference to the chemical resistent field Mr. Adderson stated, "We find our application of technical principles involving the product and application of products coming to the front both from the standpoint of application and in the manufacture. In the application of the products very little was understood from the standpoint of the ceramic manufacturers in past years as to actual service conditions which the product intended to meet. Technical background has been provided in the industry of late giving insight into your problems and through your cooperation we have been able to arrive at definite ideas as to just what you need in this work. . . ."

Before presenting the other guest speaker for the evening Chairman Coster took the opportunity to introduce the following visitors: E. F. Tucker, Stebbins Engineering Company, Watertown, N. Y., and Walter Schmidt and W. L. Penick of Western Precipitation Company at Los Angeles and San Francisco respectively.

### A. R. Heron Speaks

Chairman Coster then presented A. R. Heron, director of industrial relations of the Crown Zellerbach Corporation who chose as his topic "Can Technical Men Contribute to Good Industrial Relations?"

### Those in Attendance

Among those who attended the meeting were the following:

J. Gordon Adderson, Niles M. Anderson, W. G. Ballantyne, Thomas J. Bannan, H. W. Beecher, Iver E. Belsvig, C. H. Belvin, Dr. H. K. Benson, Emil Berger, H. K. Berger, H. L. Bibbins, S. B. Biddle, Jr., H. S. Brett, J. F. Brinkley, A. M. Buck, Leo S. Burdon, A. M. Cadigan, R. D. Campbell, R. S. Carey, John M. Carlson, Robert Carlson, Harold D. Cavin, Kenneth Chapman, R. E. Chase, Walter Clough, Sidney M. Collier, Dick H. Cook, Stephen Coney, N. W. Coster.

A. E. Duke, Erik Ekholm, E. O. Ericsson, H. H. Evans, L. P. Fortier, O. E. Fox, J. D. Fraser, N. O. Galteland, Irving R. Gard, A. S. Gerry, William R. Gibson, Harold Griep, H. M. Gustafson, Kenneth B. Hall, S. H. Harrison, Alexander R. Heron, L. E. Hill, George C. Houghton, George W. Houk, K. L. Howe, R. M. Inkster, Ray Johnson, Gertrude Julien, Frank G. Keuss, B. L. Kerns, Robert M. Kuhn, H. R. Lawrence, R. E. LeRiche, J. H. McCarthy, L. S. McGurdy, J. W. Merriman, Kyle Milligan, T. E. Moffitt.

Chas. A. Newhall, R. S. Niccolls, Fred Nicholson, E. A. Norton, F. A. Olmsted, Jerry Alcorn, W. M. Osborne, Frederic M. Pape, Walter L. Penick, Paul Pittinger, R. T. Petrie, A. S. Quinn, Carl A. Ramstad, L. B. Robinson, Oliver E. Ronken, Don Ross, James Rusk, H. R. Russell, S. A. Salmonson, W. A. Salmonson, B. W. Sawyer, George E. Schmidt, Walter A. Schmidt, Ferdi Schmitz, Harlan Scott, A. P. Siebers, Charles Server, J. E. Shackelton, Fred Shaneman, J. M. Shedd, Brian Shera, Lawrence K. Smith, Stanley E. Sorenson, L. H. Spaulding, J. D. Sullivan, P. E. Sullivan.

R. I. Thieme, Earl G. Thompson, E. F. Tucker, R. O. Vognild, Edward A. Vohs, H. F. Warren, William Webster, Fred Wellington, Jr., L. A. Wendt, F. W. Whitney, R. E. B. Wood.

## U. S. Envelope Co. Elects Officers

SPRINGFIELD, Mass., March 20, 1939—Officers of the United States Envelope company were elected as follows, last week: president, Willard E. Swift of Worcester; first vice president, Eldon V. Johnson of West Hartford, Conn.; second vice president, Ernest M. Whitcomb of Amherst; third vice president, Robert L. Allison of Longmeadow; assistant treasurer and secretary, Magnus F. Peterson of Longmeadow; assistant treasurer, James Weir of Longmeadow; general counsel, Ralph W. Crowell of West Springfield.

## PAYS TRIBUTE TO PAPER MILLS

*(Continued from page 14)*

cost of power transmission and interest on federal loans. This compares unfavorably with a unit cost of six mills per kilowatt hour constant power in modern steam plants.

### Will of M. A. Wertheimer Probated

The will of Monroe A. Wertheimer, deceased former president of the Thilmany Pulp and Paper Company, Kaukauna, Wis., has been filed for probate in the surrogate's court of New York City. It disposes of an estate formally declared to be "more than $10,000." The actual size will be determined upon appraisal. The widow, Mrs. Bess R. Wertheimer, is left an annuity of $15,000 together with real estate and personal property.

Robert S. Wertheimer, a son living at Longview, Wash., and eventually his three children, will receive the remainder of the property, including the trust fund from which the annuity will be paid. Mr. Wertheimer was chairman of the board of Thilmany company and the Longview Fiber Company, Longview, Wash., and president of the American Lakes Paper Company, Chicago. He died March 1 at the age of 76.

### Downs-Krahn Engagement

The engagement is announced of Dr. Martin L. Downs, chief chemist for Thilmany Pulp and Paper Company, Kaukauna, Wis., and Miss Anita Krahn of Oconto Falls, Wis. The wedding is to take place in April. Dr. Downs resides at Appleton, Wis.

## Gaylord Announces Further Expansion

The Gaylord Container Corporation with General Offices in Saint Louis has announced acquisition of a building at Greenville, S. C. This building is modern in every respect and will house a complete corrugated and fibre board box plant. This company has a large volume of business in the immediate section surrounding Greenville and has found it necessary to establish a plant there so as to better serve that growing volume.

The Gaylord Container Corporation has had a steady growth for several years and each year seems to acquire one or two additional plants. A new plant in Milwaukee went into operation since the first of the year, and the company recently announced a new building for their Carton Plant in Saint Louis. The Greenville Plant is expected to start operation on or about July 1.

## Wallace & Tiernan Co. Expands

The Wallace & Tiernan Company, Belleville, N. J., manufacturer of chlorine and ammonia control equipment for paper mills and other service, has purchased a four-story factory building in vicinity of plant at Mill and Main streets, totaling about 35,000 square feet of floor space, formerly used by the Knickerbocker Cutlery Company, and will occupy for expansion. During the past 18 months the company has acquired 15 parcels of land improved with buildings, making a gross addition of about 150,000 square feet of floor area for manufacturing operations.

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# CONSTRUCTION NEWS

*A Summary of Vital Facts Regarding Construction, Financing and Operation of Pulp and Paper Mills*

## General Construction News

**Detroit, Mich.**—The Detroit Paper Products Corporation, 5800 Domine street, manufacturer of paper specialties, has approved plans for installation of additional equipment at local plant and work is being placed under way. Equipment and facilities will be provided for the manufacture of new paper insulating products as an extension to company line of such materials for electric refrigerators and other service. Other new paper specialties, recently developed, also will be manufactured. Considerable increased capacity will be provided.

**Lockland, Ohio**—The Philip Carey Manufacturing Company, Lockland, Cincinnati, manufacturer of roofing papers, insulating paper products, etc., has approved plans for one-story addition, about 30 x 35 feet, and will carry out erection with day labor. Work will be placed under way at early date. Structure will be located at South Cooper and Hosea avenues. No estimates of cost has been announced.

**Portland, Ore.**—The Pacific Roofing Company, 829 Terminal Sales Building, Portland, recently organized to manufacture roofing papers, prepared roofing products, etc., has completed plans for new one-story mill at Linnton, near Portland, to be 50 x 250 feet, reported to cost over $60,000, including equipment. Contract for general erection has been awarded to A. V. Sundholm, Del Mar Apartments, Portland, and work will begin soon. At later date, company plans the construction of another unit of same size noted, to be used for storage and distributing service, and auxiliary purposes. A. E. Otis is president of new company.

**Buffalo, N. Y.**—The National Gypsum Company, 190 Delaware avenue, manufacturer of wallboard, plaster board and kindred products, will expend close to $1,000,000 during present year for completition of expansion and modernization program at different mills, begun a number of months ago and now in progress. This includes expenditures still to be made at new mill at Savannah, Ga., in course of erection, and on which work was begun last September. The new plant is expected to be completed in the spring and will represent a total investment of approximately $1,000,000, as previously stated in these columns. This mill will be used for business in the Southern district. Company is now operating at its insulating board mill at Mobile, Ala., completed late last spring, and expects to increase production schedule at the plant in near future. It is equipped for large capacity. Melvin H. Baker is president.

**New York, N. Y.**—The Park-Sunbeam Folding Box Company, Inc., 405 East Fourth street, manufacturer of folding paper boxes and containers, has a store floor and basement in building at 707 Broadway, totaling about 22,000 square feet of floor space, and will occupy for expansion.

**Rome, Ga.**—The Tubize Chatillon Corporation, 2 Park avenue, New York, N. Y., manufacturer of cellulose rayon products, has asked bids on general erection contract for new one-story addition to main mill at Rome, to be 147 x 174 feet, reported to cost over $85,000. Robert & Company, Bona Allen Building, Atlanta, Ga., are architects and engineers.

**Mexico, D. F.**—Pipsa, the Government-controlled newsprint agency, with headquarters in Mexico, D. F., has plans maturing for new pulp and paper mill, for which site has been selected. Plant will be given over to production of newsprint, and will comprise several large operating units, with storage and distributing buildings, power house and miscellaneous structures. It is said that orders for the majority of equipment will be placed with paper mill machinery manufacturers in Czechoslovakia or Germany. It is proposed to use African fiber grass, known as "vesparta", and alfalfa for a large percentage of pulp production at the mill, with intention of growing large areas of these materials in Mexico. A fund of 1,600,000 has been appropriated for the project.

**Crafton, Pa.**—The Superior Paper Products Company, Crafton, near Pittsburgh, manufacturer of paper specialties, has approved plans for new mill unit, to be one-story, reported to cost close to $50,000, including equipment. General erection contract has been awarded to Clayton M. Morris & Son, 843 Fifth street, Coraopolis, Pa., and work is scheduled to be placed under way at once.

**Rome, Ga.**—The Tubize Chatillon Corporation, 2 Park avenue, New York, N. Y., manufacturer of cellulose rayon products, has awarded general contract to the Batson-Cook Company, West Point, Ga., for new addition to main mill at Rome, consisting of a one-story structure, 147 x 174 feet, reported to cost approximately $85,000, including equipment. Work will begin at early date. Robert & Company, Bona Allen Building, Atlanta, Ga., are architects and engineers.

**Des Moines, Iowa**—Fire recently destroyed the converting plant of the Berkshire Envelope Company, 205 Grand avenue, manufacturer of commercial envelopes and kindred paper goods. An official estimate of loss has not been announced. Plans are being considered for early rebuilding. Leo Kaplan heads the company.

**Garwood, N. J.**—The Sonoco Products Company, manufacturer of paper tubing and other

paper specialties, has plans under way for new addition to local plant on North avenue, to be one-story, about 100 x 105 feet. It will be used primarily for storage and distributing service, and is estimated to cost about $35,000, with equipment. Work is scheduled to be placed under way early in the spring. Main offices of company are at Hartsville, S. C.

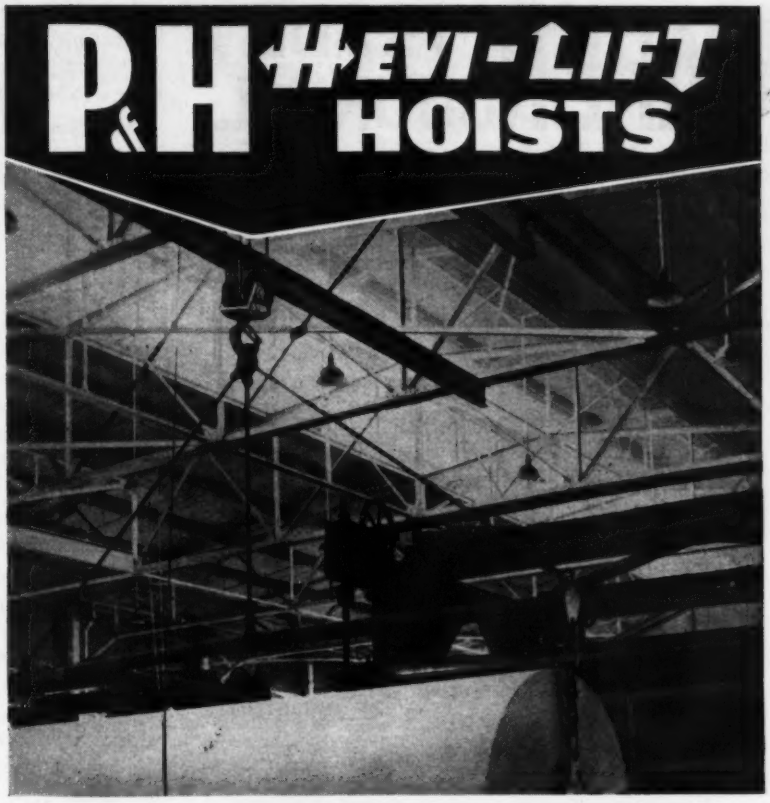
**Newton, Mass.**—The G. & S. Paper Company, Inc., 93 West street, paper products, is holding in temporary abeyance the erection of its new one-story building, 74 x 171 feet, recently referred to in these columns, with project expected to proceed during the spring. New structure will be used for storage and distribution, as well as for company offices and other operating service, and is estimated to cost close to $50,000, with equipment. Company was incorporated recently under state laws. C. S. J. White, 199 Harvard circle, Newton, is architect. Philip and Irving A. Gilfix are president and vice-president, respectively.

**Dallas, Tex.**—Fleming & Sons, 1116 East 12th street, manufacturers of paper products, are planning early rebuilding of portion of plant, location noted, recently damaged by fire with loss estimated at close to $25,000, including equipment.

**Pearisburg, Va.** — The Celanese Corporation of America, Inc., 190 Madison avenue, New York, N. Y., manufacturer of cellulose rayon products, is beginning work on the preparation of site for new mill in vicinity of Pearisburg, fronting on the New River, where total tract of about 1200 acres of land has been secured, as previously noted in these columns. A well is being drilled, about 800 feet in depth, for water supply, and pumping station will be installed at early date. Bids have closed for erection of initial mill, consisting of two main units, each three-story, 270 x 452 feet, with several auxiliary structures. Contract will be placed soon and construction started early in the spring. Work on power house is scheduled to begin at early date. Plant is estimated to cost approximately $5,000,000, with machinery. Aaron Schwartz is company engineer in charge.

**Lancaster, Pa.**—The Armstrong Cork Company, Lancaster, has resumed operations at plants at Palamos and Parafruggel in Catalonia area, Spain, following a shut-down for a number of months, and will develop to full production schedule at early date. The mills give employment to about 250 persons.

**Adelaide, Australia**—Cellulose (Australia), Ltd., Adelaide, has acquired a tract of about 80 acres of land near Beachport, South Australia, as site for new pulp and paper board mill, on which work will be placed under way this spring. Plant will consist of several large one and multi-story units and will specialize in the production of white pulp boards, building board, leather boards and kindred specialties, as well as strawboard products. It is proposed to have mill ready for service in 1940. Company will secure pulp wood from the extensive forest lands in the vicinity of the mill, and has obtained the right to use up to 20,000 tons of soft wood per annum, as well as a first call on the use of 50,000 tons of timber from area noted. Plant is reported to cost in excess of $750,000, including buildings and equipment. C. E. Piper is secretary.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Ronald G. Macdonald
*Editor Technical Section*

Lynne M. Lamm
*Washington Correspondent*

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## COMING EVENTS IN PAPER INDUSTRY

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY, Fall Meeting, Syracuse Hotel, Syracuse, N. Y., September 12-14.

NEW ENGLAND SECTION, Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Roger Smith Hotel, Holyoke, Mass.

DELAWARE VALLEY SECTION. Technical Association of the Pulp and Paper Industry—Second Friday of each month at the Engineers Club, Philadelphia, Pa.

LAKE STATES SECTION. Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

KALAMAZOO VALLEY SECTION. Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park, American Hotel, Kalamazoo, Mich.

AMERICAN PULP AND PAPER MILL SUPERINTENDENTS ASSOCIATION, Annual Convention, Wardman Park Hotel, Washington, D. C. June 13-15.

FIRST ANNUAL SOUTHERN PAPER FESTIVAL, Savannah, Ga. April 16-19.

NATIONAL SAFETY COUNCIL, PAPER AND PULP SECTION, Annual Meeting, Atlantic City, N. J. October 16-20.

## DEPRESSION AND RECOVERY

In an attempt to ascertain why the recovery period of 1932-37 was followed by the depression of 1937-38, the National Association of Manufacturers reported in its large scale group study by fifty-two leading business men and economists, that Government, industry and labor must be held responsible. The report, covering a period of one and one-half years of study of depression problems, enumerated six business policies which contribute to the depression and twelve government policies and activities which contributed and continue to operate as depressive elements.

The contributory business errors were: "(1) Mistaken inventory policies on the part of some industries, induced by the labor situation and fear of inflation: also lack of appreciation that while an increasing inventory may be necessary where sales are high, it should be in lower ratio to sales volume. (2) Unwise consumer credit policies of many companies, resulting in an increased volume of unsound installment selling. (3) Failure of many companies to improve their financial structure by reducing fixed charges; failure in many instances to avoid overcapitalization or financing with borrowed capital beyond ability to pay. (4) Too ready acceptance of apparent effects of government spending policies, and making business calculations thereon; in many instances, moreover, business deliberately sought government financial aid. (5) Failure in many instances to develop satisfactory labor relationships based on mutual respect and cooperation; failure in many instances where company policies were sound to convince workers that this was the case. (6) Failure of business to sell itself to the public, with explanation of its practices, obligations, and contributions to national improvement."

In its analysis of the policies and activities of the Government the report of the Committee enumerated the following specific factors which operated as continuing, cumulative and combined depressive elements: (1) Continued reliance upon the theory that purchasing power can be created or maintained by artificially fixing prices or by the artificial support of wage rates, both without reference to the output of goods and services. (2) Excessive, unsound and frequently unfairly administered taxes. (3) Unsound regulation of business, with particular reference to an attitude toward public utilities which has enormously slowed up expansion in a vital part of our national economy; regulation of security financing which has frequently operated to make financing difficult and expensive; and efforts to regulate agricultural production. (4) Uncertainties created by frequent expressions of public officials voicing hostile attitude toward business and investors. (5) An unsound relief program which has removed administration from those most familiar with the particular problems involved; continued 'made work' efforts in a way which undermined morale of recipients and destroyed the respect of the taxpayers.

"Although a public works program in time of depression is in theory a sound economic concept, and might be of substantial benefit, the program as carried out has been ineffective and frequently wasteful in practice", the Committee said. (6) Labor unrest resulting from the Government's labor policy, including the 'false' assumption that employer-employee relations must lead to inevitable conflict, and 'largely one-sided and biased' administration of the National Labor Relations Act. (7) The theory that the Government should control through taxes and regulation the flow of funds into private industry, both as to amount, purpose and place of investment. (8) Government price policies, efforts to intervene in general prices by controlling price levels through use of the Federal monetary, credit and banking systems, and efforts to directly influence commodity prices. (9) Continuing and increasing government competition, and threats of competition, with private business. (10) Government policies which causes a fear of inflation. (11) Inconsistency of many government methods. (12) Uncertainty as to the continuance at any time of existing government methods, and what might be proposed next."

In the report of the Committee seven major points were given which it felt should exist between the

Government and business to regain and sustain prosperity, as follows: "(1) Absence of governmental activity which prevents the effective functioning of private enterprise. (2) Support by the general public of governmental policies which will promote vigorous and efficient functioning of private enterprise, based on historic and logical demonstration that because of its accomplishments, it is superior to any other system yet tried or proposed. (3) Recognition by private business that regulation, for the public good, of certain aspects of private enterprise is an essential function of government. (4) Recognition by government that regulation of private enterprise is different from, and does not justify, direct control of the facilities of private business engaged in the production or exchange of goods and services. (5) Moderate and equitable taxes not having as their purpose the control or uneconomic restriction of individuals or corporations engaged in industry, agriculture, or commerce.

(6) Restriction of public debt to levels which do not constitute a threat to currency stability and impose undue burdens on the taxpayers. (7) Restriction of government expenditures, including federal, state and local, within government income, and maintenance of reasonable relation between government income and national income."

## D. Altman on Specifications Committee

WASHINGTON, D. C., March 22, 1939—David Altman of the Works Progress Administration has just been added to the Committee on Paper Specifications of the Joint Congressional Committee on Printing. Mr. Altman takes the place of F. P. Veitch, who for fifteen years was chairman of the Paper Specifications Committee. In addition to Mr. Altman the other members of the committee include: Ansel Wold, clerk to the Joint Committee on Printing; Francis A. Dony, printing clerk, Post Office Department; Ernest E. Emerson, director of purchases, Government Printing Office; Morris S. Kantrowitz, technical director, Government Printing Office; Dix W. Price, inspector of paper and material, Joint Committee on Printing; B. W. Scribner, chief, paper section, National Bureau of Standards, Department of Commerce; and Alla G. Stevens, superintendent of stores and traffic manager, Government Printing Office.

## Government Paper Bids

WASHINGTON, D. C., March 22, 1939—The Government Printing Office has received the following bids for 400,000 pounds of newsprint paper in 48 inch rolls: National Pulp and Paper Company, Inc., 2.425 cents; Paper Corp. of U. S., 2.99 cents; Old Dominion Paper Company, 2.9919 cents; and Barton, Duer & Koch Paper Company, 2.97 cents.

For 10,562 pounds (50,000 sheets) of 75 per cent rag, lithograph finish map paper; R. P. Andrews Paper Company, 12.03 cents; Mudge Paper Company, 11.96 cents; Barton, Duer & Koch Paper Company, 12.25 cents; Butler Company, 12.23 cents; Old Dominion Paper Company, 15.99 cents; and Walker, Goulard Plehn Company, 12.2 cents.

## Production Ratio Report

These statistics are based upon paper production reports to the American Paper and Pulp Association:

COMPARATIVE MONTHLY SUMMARIES[1]

| Months | 1939 | 1938 | 1937 | 1936 | 1935 | 1934 |
|---|---|---|---|---|---|---|
| January | 77.5% | 63.9% | 90.3% | 76.1% | 65.8% | ..... |
| February | 81.7% | 68.7% | 90.1% | 77.9% | 70.0% | ..... |
| March | ..... | 69.6% | 90.3% | 76.0% | 70.5% | ..... |
| April | ..... | 68.3% | 92.1% | 82.3% | 70.0% | ..... |
| May | ..... | 69.0% | 90.6% | 81.6% | 69.4% | ..... |
| June | ..... | 66.0% | 87.3% | 80.7% | 72.3% | ..... |
| July | ..... | 72.0% | 81.8% | 77.3% | 64.9% | ..... |
| August | ..... | 77.2% | 82.9% | 81.5% | 70.9% | ..... |
| September | ..... | 76.3% | 78.6% | 80.5% | 71.9% | 58.2% |
| October | ..... | 82.5% | 73.5% | 87.6% | 75.6% | 64.7% |
| November | ..... | 79.6% | 61.9% | 88.0% | 75.3% | 61.7% |
| December | ..... | 74.4% | 54.5% | 85.9% | 71.2% | 59.6% |
| Year Average... | ..... | 72.3% | 80.6% | 81.3% | 70.5% | ..... |
| First 10 weeks.. | 80.2% | 66.8% | 90.1% | 77.3% | 67.9% | ..... |

COMPARATIVE WEEKLY SUMMARIES[1]

| CURRENT WEEKS, 1939 | | CORRESPONDING WEEKS, 1938 | |
|---|---|---|---|
| February 4 | 80.7% | February 5 | 67.1% |
| February 11 | 82.5% | February 12 | 68.0% |
| February 18 | 82.7% | February 19 | 68.4% |
| February 25 | 80.6% | February 26 | 71.3% |
| March 4 | 83.5% | March 5 | 67.8% |
| March 11 | 83.1% | March 12 | 70.1% |

The following statistics show the number of mills reporting by ratio groups:

| | Number of Mill Reporting—Current Weeks | | | | | |
|---|---|---|---|---|---|---|
| Ratio Limits | Feb. 4, 1939 | Feb. 11, 1939 | Feb. 18, 1939 | Feb. 25, 1939 | Mar. 4, 1939 | Mar. 11, 1939 |
| 0% to 50% | 58 | 51 | 47 | 56 | 52 | 38 |
| 51% to 100% | 249 | 255 | 260 | 243 | 226 | 167 |
| Total Mills Reporting.. | 307 | 306 | 307 | 299 | 278 | 205 |

PAPERBOARD OPERATING RATIOS

Per cents of operation based on "Inch-Hours" reported to the National Paperboard Association:

| Year | Jan. | Feb. | Mar. | Apr. | May | June | July |
|---|---|---|---|---|---|---|---|
| 1935 | 62% | 68% | 68% | 63% | 61% | 66% | 62% |
| 1936 | 62% | 67% | 67% | 70% | 69% | 70% | 69% |
| 1937 | 80% | 86% | 86% | 88% | 85% | 77% | 66% |
| 1938 | 54% | 60% | 61% | 57% | 58% | 56% | 57% |
| 1939 | 60% | .... | .... | .... | .... | .... | .... |

| Year | Aug. | Sept. | Oct. | Nov. | Dec. | Year Avg. |
|---|---|---|---|---|---|---|
| 1935 | 67% | 71% | 77% | 71% | 61% | 66% |
| 1936 | 75% | 78% | 82% | 80% | 74% | 72% |
| 1937 | 74% | 69% | 65% | 55% | 45% | 73% |
| 1938 | 66% | 66% | 70% | 65% | 59% | 61% |

Week end. Feb. 4, 1939—66%
Week end. Feb. 11, 1939—69%
Week end. Feb. 18, 1939—67%
Week end. Feb. 25, 1939—68%
Week end. Mar. 4, 1939—68%
Week end. Mar. 11, 1939—70%

[1] Production-capacity ratios are based upon six-day capacity ratings which are adjusted periodically to correspond with the ratings reported by individual companies. Ratios are subject to revision until all reports are received.

## Build Experimental Pulp Plant in Taiwan

With the increased demand in Japan for pulp for the paper and rayon industries and high pulp prices resulting from import restrictions on pulp in favor of the importation of war industry supplies, an increasing interest in the pulp industry has been aroused in Taiwan during this past year. However, the Taiwan pulp industry is still in its initial or experimental stage, and pulp is at present produced chiefly from sugar cane bagasse for paper manufacturing in Taiwan. No pulp has been exported as yet to Japan or other countries, and the pulp produced at present is used for making paper and not for rayon. The Taiwan Government General Forestry Experimental Station has undertaken experiments in wood pulp production, and the Sugar Research Institute, maintained by the Taiwan Government General in Taiwan, now is building an experimental plant for the manufacture of bagasse pulp, and reportedly will begin experimental manufacture early next year.

# "Now there's an OPAQUE sheet"

Salesmen are encountering many comments such as this when offering th new improved lines—more opaque, whiter and brighter papers that arouse enthusias among paper dealers, printers and consumers.

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Section of the

Technical Association of the Pulp and Paper Industry

Edited by Ronald G. Macdonald, Secretary

# Review Of Paper Industry Literature

**Copies of United States Patents can be obtained from the United States Patent Office, Washington, D. C. for 10 cents each. Send currency, not stamps.**

## Analysis and Testing

**A Survey of Quality Control in Paper Mills.** Louis T. Stevenson. Paper Mill 61, No. 14:16-18 (April 2, 1938).—A discussion with a suggested plan of organization for quality control in a paper mill.—A.P.-C.

**The Siemens Tester for the Moisture Content of Wood.** Zellstoff u. Papier 18, No. 3:129-30 (March, 1938).—A criticism of Aiyar and Krishnan's criti- moisture content in the different parts of the wood, and of different woods, then a description of an instrument for testing the moisture content which gives results within 1 per cent from 6 to 13 per cent and 2 per cent from 13 to 23 per cent moisture.—J.F.O.

**Report Concerning Standard Testing Methods of DVM. Korn.** Wochbl. Papierfabr. 69, No. 2:29-32; No. 4:72-75 (Jan. 8, 22, 1938).—Testing method for the weight of a square meter, the thickness and the volume weight. For thickness, tests were made on one and four sheets, the ratio for one being 100 to 95. Testing the tensile, bursting and fold were next discussed. The influence of the width of the test strip, influence of the length in the tensile test, influence of the area on the bursting test, influence of moisture on all three tests, influence of time and speed of tests are described with the aid of curves.—J.F.O.

**The Hoeffler Viscosimeter.** George Hostomsky. World's Paper Trade Rev. 108:TS82-83 (Sept. 17, 1937).—The Hoeffler viscosimeter can be used for the determination of the cuprammonium viscosity of pulp as well as for the determination of other viscosities. The instrument provides an easy and accurate method of viscosity determination for pulp.—A.P.-C.

**The Cobb Test for Greaseproof Paper.** R. M. Cobb. Paper Trade J. 106, No. 15:28-29 (April 14, 1938).—The Cobb sizing test is presented for consideration as a possible method for determining grease resistance. The test is described in detail and its merits are briefly discussed.—A.P.-C.

**The Exudation Test for "Bleeding" in Bituminous Roofing.** G. L. Oliensis. Ind. Eng. Chem. Anal. Ed. 10:199-201 (April, 1938).—"Bleeding" or "strike-through," by which is meant the exudation of unsightly black spots occasionally noted on the surface of ready roofing, is due to a peculiar type of incompatibility, as yet unexplained, between the asphalt used as saturant and that used as coating. A test has been developed to measure this tendency. It consists essentially in applying a drop of the saturant to the talc-dusted surface of the coating, maintaining the latter at 110°F. for 72 hrs. and measuring the width of the black ring of discolored talc that forms around the periphery of the spot. The technic is described in detail. The safest practice is to use only saturants and coatings that show no ring whatever in the test, but no visible bleeding will occur in roofings made with a saturant and coating that develop a ring not wider than 0.5 mm. under the standard test conditions described.—A.P.-C.

**The Determination of Mechanical Wood Pulp in Paper.** S. V. Sergeant. Analyst 63:262-264 (April, 1938).—A criticism of Aiyar and Krishman's criticisms (*Analyst* 62:713 (1937)) of the Halse method for the determination of groundwood in news print. The discrepancies found by Aiyar and Krishnan are due to the fact that they overlooked that the method was intended solely for use on news print (which consists entirely of groundwood and unbleached sulphite, with or without filler, and that they did not calculate back their "ash" values to "filler." When the necessary corrections were made and the results were considered only for groundwood-unbleached sulphite papers, the results by the Halse method were in good agreement with those obtained by the standard microscopic method.—A.P.-C.

**A Study of the Oil Penetration Rate of Paper.** Gerard A. Albert. Paper Trade J. 106, No. 15:30-32 (April 14, 1938).—The difference in the time for complete oil penetration of paper using a Williams penetrometer, which has an orifice of 2½ inches diameter, and that obtained with a Westinghouse cup penetrometer, which has an orifice of ⅝ inch diameter, is due to the difference in the size of their orifices. The same values of oil penetration rate of paper would be obtained by either of these two types of penetrometers if both had the same size orifices.—A.P.-C.

**Test for Dimensional Changes in Offset Papers.** C. G. Weber and M. N. V. Geib. J. Research Nat. Bur. Standards 19:665-673 (1937).—A method has been developed for determining the expansivity of paper with variations of relative humidity, in which specimens about 24 n. long are mounted under constant tension in a cabinet in which the relative humid-

ity is controlled by salt solutions, the changes in length being observed by an optical lever.—A.P.-C.

**Spectral Reflectivity and Color of Pulp and Paper.** Paper Trade J. 106, No. 20:35-37 (May 19, 1938).—Text of TAPPI tentative standard methods T 216 m-38 and T 442 m-38 for measuring spectral reflectivity and color of pulp and of paper, respectively.—A.P.-C.

**New Test Method for Determining Between Laminated Carton and Single Ply Carton.** Gustav Faldner. Wochbl. Papierfabr. 69, No. 11:237 (March 12, 1938).—The present method for determining whether a sample of carton is laminated or single ply is to burn one corner of it. A new method is devised which is quick and simple and consists of treating the edge of a cut piece of carton with potassium iodide. The starch used in the binder for the plys turns blue and by counting the number of blue lines the number of plys can be determined.—J.F.O.

**Recent contribution to the Determination of the Volume Swelling of Fiberous Materials.** P. Eckert and K. Hoinkis. Papier-Fabr. 35, No. 47:441-43 (Nov. 19, 1937).—A measuring method as well as the apparatus is now available for the determination of the degree of swelling of natural and artificial textile fibers and webs, and furthermore this method is well adapted for the determination of swelling of impregnated textile materials. Most natural and artificial fibers possess the property of swelling in a liquid medium, some to a limited degree, such as viscose silk in water and others to an unlimited degree such as acetate silk in aceton. The apparatus is described in detail giving all measurements and then the operation and control.—J.F.O.

**Application of Laboratory Methods in the Study of Beating.** L. G. Cottrall. Svensk Papperstidn. 41, No. 6:175-193 (March 31, 1938); B. I. P. C. 8:397.—The beating experiments described in this study were directed to the treatment of sulphate pulps to determine whether Lampén mill tests were a reliable means of evaluating the behavior of pulps when beaten in the mill. Generally speaking, methods of testing pulps in the laboratory do not lend themselves very well to the investigation of problems connected with their processing in the mill, because conditions differ so basically from the operations by which paper is actually manufactured on a commercial scale. Because of the discrepancies arising from time to time between the characteristics of the pulps deduced from laboratory ball mill tests and the results obtained by processing them in the mill, a piece of apparatus was sought which would give exact duplication of mill results. The obvious way of carrying out such tests in a mill beater under standard controlled conditions had to be abandoned on account of interfering with plant operation on one hand, and the impossibility of making the necessary fine variations of certain factors on the other. For these reasons the Aylesford laboratory beater was evolved; a detailed description of the instrument is given, including certain recent alterations. With this instrument the effect of beating variables, such as power consumption, beating pressure, consistency, bar clearance, etc., on beating was studied; the results are given in numerous tables and graphs. A large number of experiments were also carried out for checking the Lampén mill tests; these are not yet concluded and no data are given. To date, all the results seem to indicate that, at least as far as sulphate pulps are concerned, ball mill tests offer a reasonable measure of the subsequent behavior of a pulp in the mill. This result would be highly satisfactory, because the Lampén mill is a simple, easily standardized apparatus, which does not require a high degree of skill to manipulate. The Aylesford beater, on the other hand, is not at all suited for routine testing, as it requires a very high degree of skill to operate it and maintain it in good working order.—C.J.W.

**Testing the Printability of Newsprint.** Olli Ant-Wuorinen and Albert Backman. Finnish Paper and Timber J. 20, No. 6:222-226, 228, 230, 232, 234-236, 238-240, 242-243 (March 31, 1938); B. I. P. C. 8:400.—"A simple test printing method is described, by which it is possible to study the mutual behavior of paper and ink and to compare the printability of different kinds of paper. All tests should be carried out at 50% rel. humidity and a temperature of 20°C. It is suggested that the opacity of paper in practice should be expressed only by the Contrast Ratio. Two new ratios are proposed for practice, the Printing Effect Ratio (P.E.R.) and the Ink Absorption Ratio (I.A.R.) which under given experimental conditions express the behavior of different kinds of paper toward the same ink. Experiments with oil-printing are recorded, and their results are expressed by a likewise new ratio, the Oil Absorption Ration (O.A.R.). These experiments show that the behavior of paper toward oil differs to such an extent from its behavior toward ink, that no direct conclusions with regard to printability can be drawn from the behavior of a paper toward oil." Tabulated data and graphs are included in the article.—C.J.W.

**Testing Packaging Materials for Permeability To Moisture.** Frederick T. Carson. Food Industries 10, No. 3:130-132, 170 (March, 1938); B. I. P. C. 8:396.—The author describes briefly various testing methods developed to measure the permeability to water vapor of many different materials, and discusses their relative merits. Test data from 28 published reports are given in two tables. These indicate that there is no definite relation between the permeability to water vapor and to air. Reference is made to the project of the Paper Testing Committee of TAPPI for working out a standardized procedure.

## Drying

**Low Temperature Drying of Cornstalk Insulating Board.** L. K. Arnold. Paper Industry 20:48-51 (April, 1938).—Cornstalk insulating boards will dry at ordinary room temperature in as short a time as 4 days if the humidity is sufficiently low. Some warping occurs under these conditions. Drying at summer temperatures and humidities (Iowa climate) is considerably slower, requiring about 2 weeks. Practically no drying occurs below freezing, so that out-of-door drying in the winter is not practical. The best results were secured by drying the boards on wire covered frames set at 30° to the horizontal and spaced 3 in. apart.—A.P.-C.

**Glued Seams for Fourdrinier Drier Felts.** John V. Ziemann. Paper Industry 20:40-41 (April, 1938).—A brief description of the procedure used at the Marinette mill of Southern Kraft Corp. to make glued fourdrinier drier felt seams, with an outline of their merits.—A.P.-C.

**Factors Influencing Drainage Through Fourdrinier Wires.** Harry G. Specht and C. M. Connor. Paper Mill 61, No. 10:11, 13, 15 (March 5, 1938).—The length of time the alum is in contact with the stock has little bearing on the drainage characteristics. The amount of sulphuric acid required for a given

pH below 6.0 is consistently less than the amount of alum required under the same conditions. There is evidence that the use of sulphuric acid to acidify the stock results in a slower drainage rate for the same pH. There is little evidence to indicate that the use of sulphuric acid would make any marked difference in the shape of the drainage curves at the normal pH values. There is evidence that regardless of the initial pH changes without the addition of alkali, the drainage is characteristic of the pH at which the drainage tests are run and not of the initial pH. There does not seem to be any relation between total acidity and the drainage; but there appears to be a relationship between pH and drainage. The presence of alkaline salts in the stock or in the water varies the pH at which the stock has the highest drainage rate. There appears to be a decrease in the measurable acidity as the time of contact of alum and stock is increased. There is one pH value for maximum drainage; this may change for various stock or water conditions.—A.P.-C.

## Specialities

**Water-Tight and Water-Resistant Papers for Packing.** Fritz Hoyer. Gelatine, Leim, Klebstoffe 6:9-12 (1938); C. A. 31:4334.—In the United States emulsified asphalt is used, either as a beater sizing or as a surface sizing, in the production of water-resistant paper. Papers so produced find particularly wide use in the automobile and radio industries. Emulsified asphalt of suitable quality is now available in Germany and its use in the manufacture of packing papers is suggested. The advantages over the hot method of application are reviewed.—C.J.W.

**About Ledger Papers.** Indian Print and Paper 3, No. 1:25 (September, 1937); B. I. P. C. 8:391.—Ledger papers may be made from rags, esparto grass, or wood, or mixtures, in varying proportions, of these fibers, the finest ledger papers containing a good proportion of rag, i.e., cotton or linen fibers. A further important feature of ledger papers is the process of sizing, the cheap qualities being engine-sized, whereas the better qualities are tub-sized. This latter fact not only results in a closer surface, better handle, and greater strength, but it causes the penmanship to be actually executed upon the fine coating of the sizing material and not upon the paper. Consequently, it is possible to erase without serious damage to the sheet. —C.J.W.

**Carbon Papers.** Indian Print and Paper 3, No. 3:38-41 (March, 1938); B. I. P. C. 8:392.—A description is given of the numerous types of carbon paper now being manufactured and some of the coating machines employed in their preparation (not exactly a translation, but similar in contents to the article abstracted in Bull. Inst. Paper Chem. 3, No. 11:269 [July, 1933]).—C.J.W.

**Evensyde, A Paper with Both Sides Structurally Identical.** Indian Print and Paper 3, No. 3:54 (March, 1938); B. I. P. C. 8:392.—Reference is made to Evensyde papers for the offset process and other grades developed along similar lines, such as Evensyde Process paper for halftone printing, Evensyde Litho for direct litho printing, Evensyde Wireless Colour Printing for high grade color work, Evensyde Pattern Cartridge for production of pattern cards, etc.—C.J.W.

**Foils and Their Lacquers.** Papier-Ztg. 63, No. 23:477-80 (March 19, 1938); B. I. P. C. 8:392.—Attention is drawn to the different kinds of lacquers used for the various types of foils (paper, metal, transparent, etc.), with special reference to metal foils (aluminum foils in particular) used for wrapping foodstuffs, such as chocolate, tea, coffee, candies, pastries, and cheese. Nitrocellulose lacquers are still used to the greatest extent; synthetic resins and chlorinated rubber are gaining in favor. Starch and casein adhesives are generally used for pasting such foils; nitrolacquers are waterproof; however, they have the disadvantage of being expensive and inflammable. Quite neutral and waterproof glues can be prepared from aqueous emulsions of polyvinyl polymerization products mixed with starch, dextrin, rubber, gum arabic, etc.—C.J.W.

**New Raw Materials for the Lacquering of Paper.** Papier-Ztg. 63, No. 31/32:664-6 (April 16, 1938); B. I. P. C. 8:392.—Reference is made to recent developments in lacquers used for water-proofing, protecting, or decorating paper, such as different cellulose esters and ethers, synthetic resins, mixtures of esters and resins, and emulsions of nitrocellulose lacquer in water.—C.J.W.

**Offset Papers.** Paper Progress 1, No. 10:27-8 (May, 1938); B. I. P. C. 8:393.—Reference is made to the desirable properties of offset papers and the different finishes in which they are made, including smooth and rough textured stocks, as well as many fancy finishes, such as crash, linen, ripple, stucco, homespun, etc. Coated offset papers are also now quite common. Good offset papers should be thoroughly sized to repel undue moisture gain, well felted to minimize grain and stretching, and lie perfectly flat, because curling and wrinkling presents a greatly accentuated problem in an offset press.—C.J.W.

**Playing Cards.** Kartonnagen-u. Papierwaren-Ztg. 42, No. 17:183 (April 29, 1938); B. I. P. C. 8:393.—A brief description of the manufacture and printing of playing cards is given. In spite of many efforts to use other substances such as celluloid, cellon, or other plastics, paper cards remain the favorite material.—C.J.W.

**Paper and Forgery.** F. Brewster. Indian Print and Paper 3, No. 3:23-6 (March, 1938); B. I. P. C. 8:393.—The author discusses different instances of paper forgery and the means for their detection. He describes methods for artificially aging paper by staining with different liquids, ironing with a hot smoothing iron, ultraviolet rays, etc. He draws special attention to the difference in the appearance of an ink stroke made before paper is folded and a stroke that crosses a fold already in existence. He deplores the absence of genuine water-marks in many papers for document purposes, also that the spacing of water-marks is often too wide apart. Forged water-marks can usually be very readily detected.—C.J.W.

**Jute Tympan Paper.** Robert F. Salade. Brit. Printer 50, No. 300:265-6 (May, 1938); B. I. P. C. 8:394.—Nearly all of the patented makes of jute tympan paper are manufactured in two types, namely oiled and plain. All are made with a hard, smooth, and uniform surface, and in a number of standard thicknesses. They are supplied in sheets and in rolls, also in ready-cut and scored sheets, for use as top sheets for packing of all modern makes and sizes of automatic flat-bed cylinder and sheet-fed rotary printing presses. Special uses include those in connection with different make-ready systems which are described in this article, such as "precision" packings

for cylinders, platen work, unmounted plates, rule formers, and proof presses.—C.J.W.

**Treating Packaging Materials Improves Keeping Quality of Food Products.** F. N. Peters and Sidney Musher. Food Industries 10, No. 3:129, 175 (March, 1938); B. I. P. C. 8:394.—The use of Avenex, an edible antioxidant prepared from oat flour, for sizing parchment, greaseproof, and glassine papers, as well as cardboard materials, for retarding rancidity and oxidative deterioration of fat-containing foods when wrapped in such treated products, is described. Reference is also made to glassine liners for coffee bags.—C.J.W.

**Enamel-Lined Blottings, their Manufacture and Use.** Vincent S. Smith. Paper & Print 11, No. 41:30, 32 (Spring, 1938); B. I. P. C. 8:395.—The manufacture of these papers represents a series of processes, including the production of the coated enamel paper, the manufacture of the blotting from either rags, esparto, or chemical wood fibers (cotton rags giving the softest and most absorbent blottings), and finally the pasting of the enamel paper to the blotting. This is the most important stage; the adhesive has to be carefully selected, in order to ensure that, while the two papers are held together effectively, it does not at the same time penetrate the blotting. Also, the adhesive has to be of such a nature that it will not affect the absorbency of the blotting or create a waviness or curl which interferes with the printing. Reference is made to the suitability of such blottings for direct mail advertising.—C.J.W.

**The Manufacture of Flat Bags from Punched-Out Sheets.** Papier-Ztg. 63, No. 33: 688-90; No. 34:708-10; No. 35:724 (April 23, 27, 30, 1938); B. I. P. C. 8:395.—The manufacture of different kinds of flat bags from punched-out sheets and the necessary machinery are described.—C.J.W.

**Paperboard Containers for Milk.** J. R. Sanborn, M. W. Yale and R. S. Breed. Fibre Containers 23, No. 5:46, 48-9 (May, 1938); B. I. P. C. 8:395.—The authors outline the principles of sanitation to be observed in the manufacture and use of paper containers for milk. They include suggestions for the paper container stock, the process of conversion, whether stock is made directly into containers or preformed in a collapsed state before final sealing, moisture-proofing, adhesives, germicides, handling of paraffin, shipping cases and storage, premade containers, cartons for shipping filled containers, and examination of containers.—C.J.W.

**Paper Making, What Should the Ink Maker Know About It?** J. G. Patrick. Am. Ink Maker 16, No. 2:18-21, 25; No. 3:27, 29, 31 (February, March, 1938).—A popular description of paper-making processes is given, with special reference to coated paper. Difficulties with paper in the printing room are discussed and remedies are listed. The importance of co-operation between paper-maker, printer, and ink maker for reducing these troubles and creating better relationships is stressed.—C.J.W.

## Casein and Its Industrial Applications

The expanding list of materials that involve the use of casein is reason enough for the publication of the second edition of Casein and Its Industrial Applications by Edwin Sutermeister and Frederick L. Browne. Mr. Sutermeister is a member of TAPPI and is chief chemist of the S. D. Warren Company. Mr. Browne is a member of the staff of the Forest Products Laboratory at Madison.

Thirteen well written chapters require 435 pages and include an author and a subject index. Each chapter is written by a different author specially qualified in his field.

F. L. Browne has written the chapters on Casein in Milk and Its Isolation, The Physical Chemistry of Casein and Casein Glues, the latter in collaboration with Don Brouse of Madison. Mr. Sutermeister wrote chapters covering Testing and Analysis of Caseins and Casein in the Paper Industry. The Organic Chemistry of Casein is described by R. A. Gortner of the University of Minnesota. A. O. Dahlberg of the Golden State Milk Products Company describes the Manufacture of Casein and A. H. Warth of the Crown Cork and Seal Company discusses the Storage of Casein. Casein Plastics is discussed by G. H. Brother of the Soybean Laboratory at Urbana, Ill., and chapters on Casein Paints, Casein in the Leather Industry and Alimentary and Medicinal Uses of Casein are included.

In his chapter on testing casein, Mr. Sutermeister refers to cleanliness, color, odor, fineness, solubility, viscosity, strength and foaming. Methods of proximate analysis are given for moisture, ash, sugar, acidity, phosphorus, calcium and nitrogen. Data is given showing the proximate analyses of several commercial caseins.

In his chapter on Casein in the Paper Industry, Mr. Sutermeister outlines the history of the use of casein and describes in detail the mill procedure for coating paper, preparing casein solutions and mixes. The defects to be found in casein are mentioned with suggestions regarding preservatives, waterproofing agents. He also comments on such other paper mill uses for casein such as its use in sizing, etc.

Copies of Casein and Its Industrial Applications may be obtained from the Book Department of the Technical Association of the Pulp and Paper Industry, 122 East 42nd street, New York, N. Y., at $6.50 per copy.

## TAPPI Ohio Section to Meet

The Ohio Section of TAPPI will hold a dinner meeting at the Hotel Manchester, Middletown, Ohio, Saturday evening, April 1.

W. Norman Kelly of the Weyerhaeuser Timber Company will talk on "The Manufacture of Sulphite Pulp" with special reference to cleanliness factors. Mr. Kelly is manager of Weyerhaeuser's bleached sulphite mill at Longview, Washington.

In addition to his talk Mr. Kelly will present a film "Trees and Man" made by the Weyerhaeuser Timber Company. The film shows logging operations on the Pacific Coast relative to the manufacture of wood pulp.

## Kalamazoo Valley TAPPI to Meet

The Kalamazoo Valley Section of TAPPI will have a dinner meeting Thursday, April 6, at the Park American Hotel in Kalamazoo. There will be two speakers: P. M. Loddengaard, of Bulkley, Dunton Pulp Company, Inc., who will discuss "Seven Process and the Flotation Save-All" and A. L. Chaplin, of Leeds & Northrup, who will talk on "pH Control and Instrumentation."

# The Flocculation of Papermaking Fibers*

By John C. Wollwage[1]


## Abstract

*Equipment and techniques have been developed to permit a dynamic study to be made of the flocculation of papermaking fibers. The procedures developed include a method of visual observation as well as a photographic technique for evaluating the degree of fiber agglomeration. The presence of alum flock in fiber suspensions, low white water temperatures, the presence of small amounts of deacetylated karaya gum, and low fiber consistencies have been shown to decrease markedly fiber flocculation. The presence of hydrophilic bentonite clay and the beating of the pulp, including hydration, fibrillation and a cutting of the fibers, tended to increase slightly the flocculation characteristics of the latter. Wetting agents had no effect on fiber flocculation; increased fiber length, although slightly enhancing flocculation, did not have a very marked effect. Mechanisms have been proposed to account for the various flocculation effects. It is concluded that a number of non-mechanical factors play important roles in the phenomenon of fiber flocculation and, accordingly, may be quite intimately concerned with sheet formation and the matting of fibers on the paper machine.*


## Introduction

The necessity of determining and isolating the various factors which influence the basic structure of a sheet of paper or, more specifically, give rise to the orientation of papermaking fibers in flowing suspension is obvious when it is desired to solve the many problems concerned with paper formation, curling of paper, and anisotropic swelling and strength characteristics of the sheet. With the advent of greater machine speeds and increased tonnage in recent years, such problems have mounted proportionally and have stimulated a considerable amount of thought and research along these lines, as indicated by the vast increase in literature dealing with the problems involved and published in the last five to ten years.

Optimum fiber dispersion in the head-box of the paper machine and maintenance of this condition until the sheet is completely formed, minimum orientation or alignment of fibers as the stock passes through the slice, and proper introduction of the stock stream onto the wire are desired to give a randomly orientated but uniform fiber web. The use of practical experience, together with the application of fundamental hydraulic principles, has done much to effect some of the desired improvements in head-box, slice, and inlet construction, and recent hydrodynamical research *(1)* on the motion of fibers in a flowing suspension has given an insight into the important features of head-box and slice design which create marked fiber orientation effects. All such work will ultimately assist in the design of wet-end paper machine equipment according to tested and proved hydraulic principles, but before this objective may be gained it seems likely that several other facts should be known about the behavior of fibers in suspension, among which is the phenomenon of fiber flocculation, or the tendency of papermaking fibers to flock after they have once been individually dispersed. Such fiber bunching may occur in the head-box of the paper machine because of improper design of the equipment, or it may take place on the wire after the stock has left the slice. In this latter case even proper design of head-box and slice would not be the answer to improvement of formation, and the flocculation effect must become of first order importance.

The agglomeration of fibers and its deleterious effects on formation, occurring under various conditions, are well known to the papermaker. To overcome such difficulties, in some instances, specific conditions for minimum flocculation have been defined by trial and error procedures. However, in general, a review of the literature will reveal that the fundamental cause or causes of the phenomenon are not known. Sometimes the effects are attributed purely to physical conditions, such as the degree of beating to which the stock has been subjected, to the degree of agitation, or to the fiber dimensions themselves. At other times, however, there may be reason to believe that surface forces involving colloidally active materials present in stock suspensions come into play and produce fiber flocculation.

## Literature Review

One of the earlier papers which discussed sheet formation in terms of the orientation of fibers as they flowed onto the wire with subsequent matting was published by McNeill *(2)*. The mechanical operation of the paper machine as it affected orientation of the fibers was of chief concern, but the following statements were made concerning flocculation. For the same amount of beating, comparative flocculating tendencies of pulps in decreasing order were given as: sulphites>krafts>bleached sulphites>soda pulps. An excess of alum, nongelatinous loadings, increased temperatures, and low consistencies were said to decrease flocculation, while rosin size, gelatinous loadings, and extreme beating were claimed to prevent fiber dispersion. It should be noted that these factors given as affecting the flocculation of fibers were observed under actual operation of the paper machine. All conditions obviously could not be held constant, and, as in the case of temperature and beating effects, apparent results may not give a true picture of the flocculation phenomena.

Strachan *(3)* has likewise reported on observations made in the mill concerning the effects of fiber flocculation. He listed the following conditions as favoring flocculation: high consistencies, very long stock or even very wet fine stock, excess neutral rosin size, low *p*H values of the white water, high temperatures, and the presence of air in the stock. It is apparent that there is disagreement here with some of McNeill's *(2)* conclusions on the effect of temperature on flocculation and, to some extent, with those on the effect of rosin. According to Strachan, ordinary neutral rosin size favors flocculation but this is said not to hold when a high free rosin size is used.

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* Presented at the Fall Meeting of the Technical Association of the Pulp and Paper Industry, Green Bay, Wisconsin, September 8-10, 1938.

A portion of a thesis submitted in partial fulfillment of the requirements of The Institute of Paper Chemistry for the Degree of Doctor of Philosophy from Lawrence College, Appleton, Wis., June, 1938.

[1] Member TAPPI, Kimberly-Clark Corp., Neenah, Wis.

It is suggested that the flocculation in the former case may be due to the larger amounts of alum used, but this does not correlate well with McNeill's conclusion that excess alum increases fiber dispersion. With regard to the marked restraining action on fiber flocculation said to be exerted by the presence of china clay, it is postulated that this may be due to the introduction of additional negatively charged colloidal particles. In other papers *(4, 5)* Strachan has further suggested that to close a sheet of long free stock it is necessary to operate at the lowest possible consistencies, presumably to prevent flocculation, and, in the purification of white water, optimum conditions are obtained by adjusting the *p*H to 7.5 with lime and allowing the flocculated fibers to settle in a conical tank.

In a subjective discussion of sheet formation on the Fourdrinier wire, Rubin *(6)* stressed the importance of the drainage characteristics of the stock as they relate to the formation of the sheet. However, he also considered the necessity of maximum fiber dispersion as the stock goes on the wire and, at head-box consistencies with equivalent beaten stocks, listed the following order for the degree of stock dispersion in water: esparto>soda>bleached sulphite>kraft>unbleached sulphite>cotton>linen. Clay was said to slow up the drainage specifically of a newsprint furnish and thus to improve formation with no mention of the fact that the clay may have exerted a direct effect on the flocculation characteristics of the fibers themselves. In contrast to statements of other investigators, Rubin states that clays and starches, having the properties of plastic colloids, assist in fiber dispersion and closer sheet formation. Fiber dispersion is also said to be related to the rate of fiber swelling and to hydration or fibrillation obtained during beating. With regard to temperature effects, it is proposed that colder water reduces drainage rates, enhances the effect of the shake, and thus improves formation, but no mention is made of the possibility of a direct effect of temperature on fiber flocculation which might be due to alteration of fiber-fiber adhesion forces or to an increase in the viscosity of the dispersing medium.

Specht and co-workers have published two reports *(7, 8)* on the investigation of factors influencing drainage through Fourdrinier wires and, among other results concerning the effect of wire mesh on drainage rates, etc., they found that, at a *p*H of approximately 5.3, stock drainage through a number of different weaves of wires for a news furnish was at a maximum. In the second paper *(8)* one of the conclusions reached was that there is one *p*H value for maximum drainage which, however, changes for various stock or water conditions. Fiber flocculation might very well influence the drainage properties of a stock, but whether some of the effects observed by Specht are due to flocculation or to some other factor such as a surface tension decrease in the white water cannot be ascertained from the data presented.

Certainly the *p*H of the white water in a papermaking furnish, as well as the effects of alumina adsorption by the fibers and the adsorption of anions in solution, conceivably may have an appreciable effect on the degree of fiber dispersion. It has been stated in work already reviewed that low *p*H values, as well as *p*H values above the neutral point, increase fiber flocculation. Some of the complexities of the papermaking furnish from a colloidal point of view have been described by Rowland *(9)* and may well be of interest with further work on fiber flocculation phenomena.

Of interest with regard to filler retention and to possible effects on fiber flocculation is the recently proposed Sveen method for increasing the retention of fillers and fibers described by Loddengaard *(10)*. A weak solution of a matured animal glue is added to suspensions of fibers and/or fillers in which a small amount of alum is present, and as such is claimed to be a powerful flocculating agent. Improvement in retention presumably includes rosin size, pigments, and dyestuffs; furthermore, the glue is claimed to have a corresponding flocculating effect on the remaining solids in the white water, facilitating recovery in save-alls. Nothing is mentioned regarding the effect of the glue on the actual fiber dispersion in the head-box and on the machine wire and the resulting sheet formation, but the fact that the glue is claimed to aid fiber recovery in white water suggests that it might bring about flocculation of fibers on the wire. On the other hand, if addition of the glue increased the viscosity of the white water to any extent, which is possible even with the addition of very small amounts of large colloidally active molecules, an improvement in fiber dispersion might be expected, due either to enhanced shearing forces within the dispersing liquid itself or to decreased velocity of fiber rotations resulting in less fiber-fiber collisions. A recent report *(21)* on the use of Sveen glue has noted that at least no injurious effects on sheet formation could be observed.

A condition of interest for comparison with the use of Sveen glue for improvement of retention is that attained by the addition of very small amounts of deacetylated karaya gum, a colloidal material, to the papermaking furnish to effect dispersion of the fiber constituents. The use of the gum to secure good formation in various types of papers is covered by a patent issued to LeCompte *(26)*. The effect of the gum on the viscosity of any white water in concentration as low as 0.02 per cent is quite marked, but whether this accounts for the improved fiber dispersion or whether there is a colloidal effect altering energy forces on the fiber surfaces does not seem to be known.

Laboratory observations have been made on fiber agglomeration by Campbell and Yorsten *(11)*, who found that very dilute suspensions of cotton linters, passing a 200 mesh screen, rapidly formed flocks a few millimeters in diameter in distilled water as well as in dilute solutions of acid, alkali, or alum. Similar flocculation of groundwood, screened to pass 200 mesh, dried with methyl alcohol, and suspended in a solution of ethyl alcohol and chloroform of about the same density as the fibers, was observed. The authors suggested the possibility of obtaining measurements of these flocculation effects in an apparatus in which pulp is disintegrated in a jar and at the same time circulated slowly through a wide tube outside the jar, but they reported no further work along this line. Measurements were also made on the compactness of flocculated fibers by allowing stock of known low consistencies to settle in graduated cylinders, but the data obtained were not suitable for extrapolation to give any indication of the consistency of the individual flocks. These investigators found further that univalent electrolytes in moderate concentration (0.01 *M* HCl, NaOH, and KCl) brought about almost complete retention of groundwood fines when a suspension of unscreened groundwood was allowed to settle in water. It was stated that, without the presence of the electrolytes or a pretreatment by boiling the pulp

suspension, the dispersed fiber left a cloudy suspension of very fine material which settled with much difficulty. Microscopic evidence seemed to be in agreement with the conclusion that the very dilute electrolytes or boiling caused precipitation of the fines on the larger fibers. Experiments were also reported in which the flow of electrolyte solutions through preformed sheets was found to be greater than that of distilled water.

Investigating the effects of beating on fibrous cellulose, Bell *(12)* established the fact that electrolytes, the effect of boiling hydrated pulp, and the dehydrating effect of alcohol markedly increased the rate of flow of water through pulp pads. It was concluded that this ionic coagulation phenomena in the case of beaten fibers may indicate the occurrence of any or all of three effects: alteration of pore size, change of electric charge on the fiber, and dehydration. The first two of these effects may be the result of fiber flocculation or coagulation. By determining the contraction on drying of a standard pressed fiber cake which presumably measured the development of a colloidal surface film on cellulose fibers during beating, Bell also observed that dilute solutions of electrolytes, boiling, or prolonged steeping of pulp in water had no effect on the colloidal surface film as measured by contraction of the pressed pulp cake. The difference between these results and those observed in the determination of flow rates may indicate fiber flocculation rather than a dehydration effect as a factor involved.

A portion of Bell's work was checked at the Forest Products Laboratory of Canada *(13);* the interpretation given was that the effect involved a probable reduction in negative charge on the pulp surface, which would allow surfaces already close together to approach nearer. Additional work from the same laboratory *(14)* indicated that the effects of electrolytes in hard water on the freeness of groundwood pulps were negligible.

The literature thus far reviewed has been chiefly concerned with fiber flocculation as it is involved in the problems of obtaining maximum fiber dispersion. It should be of interest to consider briefly the use of save-alls in fiber recovery and to review conditions known to effect the maximum fiber flocculation desired in this operation. Numerous articles regarding these points have been published and a considerable number of them, particularly concerned with sedimentation and flotation type save-alls, have been cited at the end of this paper *(15-20, 22-25)*. From these it would seem that the factors affecting fiber flocculation in a save-all recovery system are not always the same. Large dosages of alum have been effective in aiding flocculation and sedimentation in some cases, whereas in others a reversible process, involving an isoelectric point, has been observed and care not to overdose has had to be taken. Lime has been added to the white water to form all the alumina possible from the available aluminum present, and this step has increased fiber recovery. Lime alone has been said to free the drainage from stock, but whether this was a flocculation effect could not be deduced. In flotation type save-alls, all chemical dosage of rosin size, alum, and caustic aided flocculation and the efficiency of the system, but in general care had to be taken to prevent overdosing. Fillers were observed to interfere with fiber recovery, except when a flocculating glue was used in the white water. High temperature was said to favor flocculation and fiber recovery in a sedimentation save-all, but the effect was not observed in a save-all of the flotation type.

To summarize the above review of the literature it may be said that from observations made chiefly in actual mill operation investigators have postulated that the following factors increase fiber flocculation, or adversely affect sheet formation: rosin sizing gelatinous loadings, long fibered stocks, appreciable hydration, low $p$H values of white water or $p$H values above the neutral point (obtained with lime), and the presence of air. Bleaching, the presence of non-gelatinous loadings, low consistency and agitation are said generally to decrease flocculation. There were conflicting reports as to the effects of temperature and, to some extent, on the addition of alum and the effects of beating on flocculation.

Drainage rates from pulps have been shown to be optimum at rather definite $p$H values, which fact may involve fiber flocculation. The use of sulphuric acid rather than alum to acidify the stock in such experiments resulted in a slower drainage rate at the same $p$H. Also, making the white water alkaline with lime in the absence of alum was said to free up the stock drainage.

The use of a deacetylated colloidal gum, even in concentration as low as 0.02 per cent, has been proposed to aid in obtaining fiber dispersion. Whether its action was due to an increase in the viscosity of the suspending fluid or to a colloidal effect altering energy forces on the fiber surfaces did not seem to be known. Matured animal glue was reported to have favorable effects on increasing retention on the wire and in effecting flocculation of fines and solids in white water, but no detrimental effects on sheet formation on the wire because of fiber flocculation at that point were observed.

Laboratory observations have been made on the flocculation of groundwood fines and on beaten cotton linters by the addition of univalent electrolytes in very small concentration or by the boiling of the fiber suspension. Other work on the flow of solutions through pulp pads further indicates that electrolytes, boiling and steeping of fibers, etc., may have an appreciable effect on the matting characteristics of pulp and that flocculation effects may be involved in such changes.

In white water treatment, where maximum fiber flocculation is desired, large dosages of alum, obtained by introducing considerable amounts of alumina into the system, seemed mechanically to flocculate fibers in sedimentation type save-alls. In flotation save-alls, the dosage of alum, as well as rosin size and caustic, appeared to be more critical, too much of the chemicals being as harmful as too little. The effects of temperature and $p$H were again in question.

Since the published literature contained a number of contradictions concerning fiber flocculation effects and since there is a lack of knowledge of fundamental causes of fiber agglomeration, it appeared desirable to follow comprehensibly some of the causes of papermaking fiber flocculation and to evaluate relatively the importance of such causes to problems of fiber dispersion and of sheet formation on the wet end of the paper machine, to problems of fiber dispersion in the pulp mill such as might be encountered in riffling, screening, and fractionation, and possibly to problems of fiber agglomeration in white water recovery.

### Development of Equipment

It followed logically that there would first have

to be developed equipment and techniques which would allow control of all the variables involved and at the same time permit a qualitative or, preferably, quantitative measurement to be made of the degree and rate of fiber flocculation.

Preliminary considerations indicated that at least two types of flocculation measurements might be made on a fibrous pulp suspension, a static and a dynamic measurement. Equipment for static measurements of flocculation could conceivably be quite simple in design and construction, consisting of only a glass tank in which fiber dispersion could be obtained by turbulent agitation with stirrers. After the pulp had been dispersed, the stirrers could be stopped and the degree and rate of flocculation followed visually or photographically. However, the success of such apparatus would depend on how well equivalent degrees of dispersion could be obtained by the turbulent stirring action. In any turbulent fluid motion fluid particles always move in an erratic and undetermined course and, as such, would affect the dispersion of the suspended fibers. Reproducibility of dispersion can be expected only if the fluid motion producing it is reproducible. Accordingly, it seemed doubtful that results could be duplicated in this "tank" type equipment; furthermore, factors affecting fiber settling characteristics, such as their density, would have an appreciable influence on the results. A dynamic method of measurement, which would allow the fibers to be acted upon by a continuous but constant and controlled agitation and would permit the observation of flocculation under actual flow conditions, seemed much more desirable.

## The Flocculation Tester

The equipment which was finally developed to make such dynamic measurements of fiber flocculation, and which may be referred to as the flocculation tester, consisted of a system in which controlled laminar flow of a well-dispersed stock suspension, free from eddy currents, could be observed in a vertical glass pipe. The apparatus may best be described with reference to Figs. 1 and 2, a diagrammatic sketch and a photograph, respectively.

The initial dispersion of the fibers was accomplished by vigorous stirring in a head-box constructed of 16-gauge sheet copper, 30 inches square and 15 inches deep. Four motor-driven, double-blade stirrers were used to give complete agitation. The head-box was connected to the upper end of an 8-foot vertical glass pipe by a 9-inch to 3-inch copper reducer. The vertical glass pipe, or the observation tube, was an 8-foot length of 3-inch nominal size Pyrex glass pipe, selected for visual work to be free of internal strains and imperfections which would impair visibility. Connection of the flanged copper reducer to the glass observation tube was made with a flanged pipe joint furnished by the Corning Glass Works and described in their Bulletin *(28)*.

The lower end of the flocculation tube was connected to a second flanged copper reducer (3 inches to 1 inch in 6 inches) with the same type of flanged pipe joint. This was the start of the return flow piping system, which included flow valves for the regulation of the flow rate through the observation tube, a calibrated glass cylinder for directly measuring flow rates, and a small centrifugal pump.

As seen in Fig. 2, the stock suspension after leaving the observation tube was carried by a 1-inch copper pipe up to a stopcock control valve used for regulating the flow of stock through the observation tube. After it had passed through this stopcock, the flow of stock was then directed into a glass flow-measuring cylinder. A free fluid surface always existed in the latter and the column of the fluid served to impress a head on the suction end of a small centrifugal pump. The discharge from the pump was piped directly up to the head-box, and in this return line there was a shut-off gate valve to throttle the discharge rate of the pump. The 1-inch copper piping carrying the stock in this return flow system was connected with Mueller streamline brass fittings. These fittings are machined with an inside shoulder to match the pipe diameter and wall thickness, and when a solder seal is completed the interior of the pipe and fittings is of uniform size. This was of advantage in preventing stock from "hanging up" and accumulating in tees and elbows and permitted very rapid cleaning of the equipment. The use of copper pipe and fittings, as well as a copper head-box, was necessary to prevent corrosion and the introduction of extraneous metallic ions into the system.

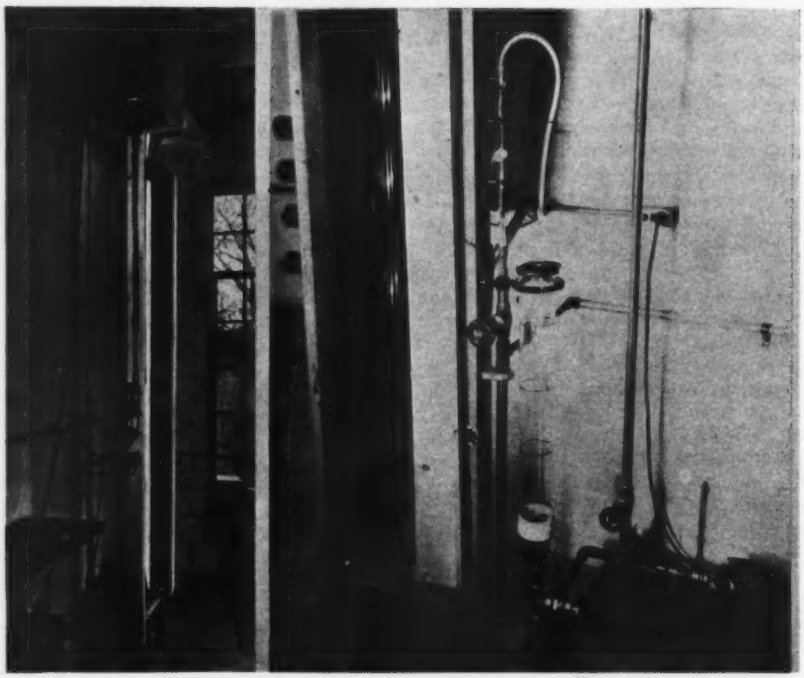


Fig. 1 Fig. 2

Fig. 1. Flocculation Tester. Fig. 2. Pumping and Metering Systems of Flocculation Tester.

The equipment functioned in the following manner. After the pulp suspension was well dispersed in the

head-box by vigorous mechanical agitation, it entered the glass observation tube by flowing through a system of baffles and the 9-inch to 3-inch copper reducer. The baffles were used to eliminate eddy currents, created by turbulent stirring, from passing down into the observation tube. After the stock dispersion entered the latter, its flow was maintained slow enough to be laminar, or so-called "stationary" flow, to prevent the formation of eddies within the tube, and to impose reproducible conditions of agitation. In the conception of laminar flow, fluid particles are considered to move along fixed paths (usually referred to as streamlines), the velocity at any given point on any given path being constant. A closed surface of such paths acts as a small imaginary tube through which the portions of the liquid, comprising the total cross section of the pipe, move. The relative velocities of the streamlines vary, but in ordinary hydraulic problems involving flow in pipes the fluid velocity is regarded as the average of the individual streams. However, when rod-like particles such as papermaking fibers are suspended in a fluid, these relative velocities are of significance and, through viscous action on the fiber surface, cause the fiber to rotate, the exact motion imparted to the fiber depending on its orientation to the velocity gradient. It can be shown mathematically that, for appreciable velocity gradients, fibers would turn end over and with the speed of rotation directly proportional to the velocity gradient. Further, two or more fibers in immediate contact and moving down the tube would tend to be pulled apart, depending upon the relative shearing forces due to the velocity gradients which exist across the pipe and the adhesive forces, mechanical or otherwise, which tend to keep the fibers together.

Accordingly, the following conditions may be postulated to exist in the dilute stock suspension flowing laminarly through the vertical glass observation tube of the flocculation tester: *(a)* The stock enters the top of the tube in a completely dispersed condition and with a minimum of eddy currents in the dispersing medium. *(b)* As the dispersion moves down the column, fibers are acted upon by viscous forces due to relative motions in the fluid, individual fibers being rotated, moved about, and brought into contact, and groups of two or more fibers which may be adhering together tending to be sheared apart. *(c)* At some point down the flow tube, the number of fibers colliding with each other and tending to adhere will exceed the number being sheared apart and separated by the fluid motion and, at this point, fiber bunching or flocculation should be observed. *(d)* Since the shearing forces will vary with changes in fluid velocity in the tube, the flocculation point will depend on the flow rate.

Both visual and photographic techniques were used to determine the point down the observation tube at which flocculation occurred, details of which will be subsequently described. It is to be emphasized that, in order to attain reproducible and constant conditions of agitation on the fibers of the flowing suspension, it was necessary to baffle efficiently the stock moving from the head-box into the observation tube and to maintain laminar flow at all times in the latter.

The stock suspension was continuously recirculated in the tester; the throttling valve in the discharge line of the centrifugal pump was adjusted so that the pump capacity equaled the rate of flow through the observation tube at any given time. The fact that both visual and photographic determinations of the flocculated conditions of the fibers were to to be made necessitated uniform lighting of the entire 8-foot glass observation tube. This lighting was accomplished by using a battery of 8 lights, mounted in a diffusing box which was placed alongside and to the right of the observation tube (*see* Fig. 1). The lights in the diffusing box were mounted sufficiently well back in the box so that any direct illumination did not reach the glass tube. Direct illumination was undesirable because of the marked refraction of the images of the light source by the circular glass tube. A black matte diffusing surface was mounted directly behind the observation tube and gave good contrast to the fibers viewed by reflected light. For visual purposes, eight 100-watt frosted glass bulbs were used in the diffusing box. When photographs were taken the middle six of these bulbs were replaced with 500-watt Photoflood lamps.

### Calibration of the Equipment

The total volume of water contained in the flocculation tester was 55.6 gallons at 15 deg. C., or 464 pounds. This included 12.7 inches of depth in the head-box, the entire volume of the reducer on the head-box, the observation tube volume, and the volume of the return flow system, inclusive of the 3-liter volume of the metering cylinder. The latter was calibrated to contain 3 liters, exclusive of the volume of the inlet tube. The cylinder was used to measure the mean velocity of flow in the observation tube. After the stopcock in the return flow system had been adjusted to give approximately the desired flow rate, the gate valve below the calibrated glass cylinder was closed. The complete volume of flow through the observation tube was then retained in the cylinder, and timing the flow of 3 liters permitted subsequent calculation of flow velocity. Immediately after the fluid level passed the 3-liter graduation mark, the lower gate valve was reopened and adjusted to "bleed" a sufficient amount of the stock suspension into the suction end of the pump to maintain the fluid level at approximately the 1½-liter mark in the cylinder.

The necessity of maintaining laminar flow in the vertical observation tube has already been discussed. Laminar flow in pipes is limited hydraulically by the critical velocity. If the latter is not exceeded, flow through any particular system, for which the critical value has been calculated, will be non-turbulent, or laminar. The relation giving critical velocity in circular pipes in terms of the Reynolds' criterion, $R$, absolute viscosity, $u$, diameter of the tube, $d$, and the fluid density, $\rho$, is:

$$V_c = R_c \cdot u/d \cdot \rho .$$

Values for the Reynolds' criterion depend on the particular system and circumstances in question. However, the value of 2100 for circular pipes has been given as an absolute minimum *(27)* and, in the absence of actual flow tests on the system, a lower critical velocity can be safely calculated using this value. For the 3-inch diameter glass tube of the flocculation apparatus, the critical velocity is then 0.0905 feet/sec., which corresponds to a maximum flow volume of 7.56 liters/min., or a flow time of 24 seconds for 3 liters. Only in a few cases was this flow rate exceeded, thus assuring viscous or laminar flow for all conditions.

## Experimental Procedures

The standard procedure adopted for making a flocculation run consisted of the following steps: *(a)* The flocculation apparatus was filled with 464 pounds of

water (a relatively hard water from the city of Appleton mains unless otherwise specified) to the calibrated level in the head-box. *(b)* The standard temperature was 25 deg. C., the water being warmed or cooled as necessary by the use of indirect heating or cooling through a copper coil immersed in the head-box. Variations in actual temperatures from the values specified in any experiment were generally within ±1 deg. C., with occasional maximum variations of ±2 deg. C. *(c)* The amount of pulp to give the desired consistency in the apparatus was stirred in two liters of water for 7500 revolutions in the standard British disintegrator (described in the TAPPI Standard Method, T 205 m-36) prior to its addition to the head-box of the tester. The standard stock consistency which was used as the effects of other variables on flocculation were investigated was 0.01 per cent; this value had been indicated by preliminary experiments as optimum for the purposes of visual observation. *(d)* The four high-speed stirrers in the head-box were adjusted as well as possible to a constant speed by setting rheostat controls, so that a constant fixed resistance was always in series with each motor. *(e)* Chemicals, if required in the white water for a particular run, were added at this point, the complete furnish allowed to circulate for at least 15 minutes, and a sample of white water withdrawn by pipette for *p*H determination, if the addition of chemicals was expected to change this value. *(f)* Evaluations of the flocculation end-points were made at specific flow rates in the observation tube where definite fiber bunches could be seen, as well as small portions of the dispersing medium which were devoid of fibers. Above this point there existed a relatively complete degree of dispersion of the fibers, but below it, the condition was one of definite flocculation. Visual observation was made under optimum conditions of illumination with the observer standing approximately 10 feet from the glass tube. *(g)* As previously given, the flow rate through the observation tube was adjusted with the stopcock control. Furthermore, for any given conditions, only that range of flow rates was used which gave flocculation end-points between 10 and 35 units on the arbitrary flocculation scale mounted alongside of the observation tube (*see* Fig. 2). The mean velocity of flow through the latter was determined by measuring the time for the flow of 3 liters of the stock suspension into the calibrated measuring cylinder and using the equation:

$$V = 3000/\pi \cdot r^2 \cdot T = 64.93/T,$$

where $V$ is the mean velocity of stock through the observation tube in centimeters per second, $r$ is the radius of the observation tube, and $T$, subsequently referred to as the flow time, is the time in seconds for the flow of 3 liters of suspension. *(h)* Two determinations of the flow time were always obtained before any flocculation observations were made. A third determination of the flow time was made after the flocculation end-point had been evaluated. All three values usually agreed to within ±0.5 second and were averaged to give a value of $T$, used to calculate $V$, the flow velocity, in the equation given above. *(i)* After a definite and constant flow rate had been set and determined, at least seven separate estimations of each flocculation end-point, described in *(f)* above, were made during a period of approximately 5 minutes' duration. These seven values, necessarily somewhat subjective in nature, always agreed to within a maximum range of five units on the flocculation scale; usually the agreement was better than this. Five units correspond to 10 inches on the 8-foot scale. The seven readings were averaged and recorded as the flocculation value for the specific flow time. *(j)* At least ten such flocculation end-points were determined for each of ten specific flow rates. These data then permitted calculation of a mathematical relation between the flocculation value and the flow velocity, the details of which will be described in a following section. *(k)* Photographs of the observation tube for a permanent visual record of specific flocculation conditions were usually taken after the visual observations had been made. *(l)* After evaluations of the degree of flocculation had been made both visually and photographically, a final sample of the white water was withdrawn for *p*H measurement, and the temperature in the head-box recorded. Also, two 1-liter samples of the fiber suspension were removed from the head-box, each sample from a different position, and were filtered through tared Jena 1-G-1, fritted glass bottom crucibles. The filtered samples were dried to constant weight at 105 deg. C., giving a check on the consistency of the stock suspension used for the particular run.

All *p*H determinations run on white water samples were made with the glass electrode calibrated against *M*/20 potassium acid phthalate buffer solution. Measurements were made always at room temperature and were accurate to within 0.05 *p*H unit.

Photographs of the observation tube were taken with an 8 by 10-inch wide angle protar lens with the aperture set at f.12.5. Supersensitive panchromatic film and an exposure time of 1/25 of a second were used.

## Treatment of Data, Concept, and Calculation of the Flocculation Index

As already discussed, the variables measured directly were the flow time for 3 liters of the fiber suspension, $T$, and the flocculation value, $F$, or arbitrary scale reading connoting distance down the observation tube at which fiber flocks were definitely formed. From the flow time the flow rate or velocity of the suspension through the observation tube could be calculated using the equation:

$$V = 64.9/T.$$

To show how a mathematical relation between $F$, the flocculation value, and $V$, the flow velocity, was obtained, Table I, which gives the basic and calculated data used in the procedure, is presented. The data

TABLE I.—FLOCCULATION RUN NO. 11

Unbleached Spruce Sulphite Stock. Consistency 0.0101 per cent. Tap Water, pH 7.1. pH at end of run 8.2. Temperature 25 deg. C.

| $T$ (sec.) | $F$ (arb. units) | $V$ (cm./sec.) | log$F$ | log$V$ | (log$V$)$^2$ | log$V$ · log$F$ |
|---|---|---|---|---|---|---|
| 65.6 | 19.0 | 0.990 | 1.2788 | —.0045 | .0000 | —.0058 |
| 52.0 | 25.2 | 1.249 | 1.4014 | .0965 | .0093 | .1352 |
| 40.3 | 31.4 | 1.612 | 1.4969 | .2073 | .0430 | .3103 |
| 137.4 | 10.8 | 0.472 | 1.0334 | —.3261 | .1063 | —.3370 |
| 50.8 | 23.0 | 1.279 | 1.3617 | .1069 | .0114 | .1456 |
| 84.5 | 14.6 | 0.768 | 1.1644 | —.1143 | .0131 | —.1331 |
| 43.2 | 27.8 | 1.503 | 1.4440 | .1769 | .0313 | .2554 |
| 106.2 | 12.9 | 0.612 | 1.1106 | —.2136 | .0456 | —.2372 |
| 57.6 | 21.6 | 1.127 | 1.3345 | .0518 | .0027 | .0691 |
| 88.1 | 14.6 | 0.736 | 1.1644 | —.1328 | .0176 | —.1546 |
| 117.4 | 10.4 | 0.553 | 1.0170 | —.2573 | .0662 | —.2617 |
| 46.6 | 26.6 | 1.393 | 1.4249 | .1440 | .0207 | .2052 |
| 68.5 | 19.7 | 0.948 | 1.2945 | —.0232 | .0005 | —.0300 |
| 95.5 | 14.4 | 0.680 | 1.1584 | —.1675 | .0280 | —.1940 |
| 77.0 | 16.6 | 0.844 | 1.2201 | —.0793 | .0063 | —.0968 |
| Sum | | | 18.905 | —.5352 | .4020 | —.3294 |

are for a run giving the flocculation characteristics of an unbleached spruce sulphite stock dispersed in tap water at a *p*H of 7.1, 0.0101 per cent fiber consistency, and at a temperature of 25 deg. C.

Points of flocculation were visually estimated for fifteen different flow velocities in the range of 0.5 to 1.5 cm. per second. Column 1 gives the actual flow time in seconds for a 3-liter volume of the fiber suspension; column 2 is the flocculation scale reading; column 3 gives the velocities of flow calculated from the values in column 1. The remainder of the column headings are self explanatory and are tabulated since they are used in subsequent calculations. Summations of the last four columns are given at the bottom of the table.

Plotting the flocculation values, $F$, as ordinates against the actual flow time, $T$, gave a series of points which appeared to vary as a power function of the type,

$$F = K_1 \cdot T^{K_2} , \quad (1)$$

$K_1$ and $K_2$ being constants, with the latter having a negative value. It is interesting to note that plotting the flocculation values directly against $V$, the velocity, rather than the flow time, $T$, would at first appear to give a linear relation between $F$ and $V$. If equation (1) expresses the relation of $F$ and $T$, then since

$$T = 64.93/V , \quad (2)$$

the following equation results:

$$F = K_1 \cdot 64.93^{K_2}/V^{K_2} . \quad (3)$$

With this latter relation, if the power constant, $K_2$, is a negative number between 0 and 1, it is possible that $F$ and $V$ would appear to vary linearly within a limited range of values.

The adequacy of using the power function given in equations (1) and (3) was checked by plotting $F$ against both $T$ and $V$ on logarithmic coordinate paper. Since straight lines were obtained in both cases, the relation was deemed suitable.

The values of $F$ and $V$ were fitted to a curve by the method of least squares. Taking the logarithm of both sides of equation (3) results in:

$$\log F = \log K_1 + K_2 \cdot \log 64.93 - K_2 \cdot \log V \quad (4)$$

$$or \qquad \log F = K_3 - K_2 \cdot \log V . \quad (5)$$

This gives a direct linear relation between the logarithms of $F$ and $V$. Since $F$, $V$, and $K_3$ are necessarily positive numbers, the usual method of fitting a line of the type, $y = a + b \cdot x$ by least squares can be used. This entails solving the normal equations to obtain the constants $K_2$ and $K_3$. These equations are:

$$K_3 \cdot \Sigma 1 - K_2 \cdot \Sigma \log V - \Sigma \log F = 0, \text{ and} \quad (6)$$

$$K_3 \cdot \Sigma \log V - K_2 \cdot \Sigma (\log V)^2 - \Sigma \log V \cdot \log F = 0 . \quad (7)$$

Referring specifically to Table I, the normal equations for this specific run become:

$$15\ K_3 + 0.5352\ K_2 - 18.905 = 0, \text{ and} \quad (8)$$

$$-0.5352\ K_3 - 0.402\ K_2 + 0.3294 = 0 . \quad (9)$$

Solving (8) and (9) simultaneously gives:

$$K_2 = -0.901 , \text{ and}$$

$$K_3 = 1.29 ,$$

and the relation between $\log F$ and $\log V$ is expressed in the equation:

$$\log F = 1.29 + 0.901 \log V . \quad (10)$$

The data of Table I are plotted in Fig. 3 and the curve defined by equation (10) fitted to the points.

The parameter constant of equation (10), $K_3$, can be used to characterize numerically the degree of flocculation or the flocculation tendencies of the unbleached spruce sulphite pulp under the specific conditions for which the data in Table I were obtained. Likewise, for any other conditions, similar calculation of the parameter constant in the general equation (5) above will allow numerical comparison of the fiber flocculating tendencies in each case. Some attention may also be given to the first derivative of the log-log relation, but whether this slope constant, $K_2$, will be constant for all conditions is somewhat a matter of conjecture. It is obvious that it will not approach zero or one, but it also seems probable that smaller variations, greater than might be attributed to experimental error, could have some significance with regard to the mechanism of the fiber flocculation.

The parameter constant, $K_3$, has been termed the *dispersion index*. It is a pure number, inversely proportional to the degree of flocculation observed under given conditions in the flocculation tester.

Before completing the discussion of the flocculation tester and methods of procedure, it may be well to consider briefly the subjective nature of the visual end-point. The end-point, as it was observed in the glass tube, has already been described. Careful standardization of this part of the procedure was required to eliminate as much subjective error in the measurement as possible. It was found necessary to view the flocculation tube from a distance of at least 10 feet, so that the entire tube could be seen in perspective. To assist further in obtaining this latter condition, it was desirable to have the observer turn his head through 90 degrees and make the observations with both eyes in the same vertical line. The end-point was then judged as the position above which the fibers appeared reasonably well dispersed and below which definite flocculation occurred. This made it necessary to limit the range of flow velocities, so that the end-point did not occur above 10 or below 35 units on the flocculation scale, since at these values there was both dispersed and flocculated stock above and below each of the limiting end-points.

Care also had to be exercised in judging the flocculation end-point in different runs exhibiting widely different degrees of dispersion. When very marked dispersion existed, such as that obtained with the addition of a small amount of alum, the largest fiber flocks that formed were very much smaller than those obtained, for example, in the case of a fiber and water dispersion alone. In the latter case the flocks may have been of the order of several centimeters in diameter, while in the former case they were only one-fifth to one-third this size. The flocculation end-point, however, was always judged, not by the size of the fiber bunches formed, but as that point above which the fibers appeared dispersed relative to a flocculated condition existing below the end-point. Thus, in the case of the marked dispersion obtained with alum,

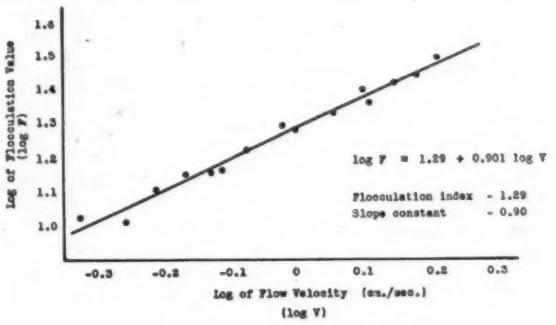



FIG. 3
**Flocculation Run No. 11. (See Table I for Conditions)**

the degree of flocculation at any given end-point would not have been as harmful to the formation of a sheet as that amount of flocculation occurring at an end-point observed in the case of a fiber-water dispersion. This may make for some inconsistency in relative values of the flocculation indices, but it was the optimum procedure with regard to obtaining reproducibility of results.

PULPS USED IN THE EXPERIMENTAL WORK

The majority of experiments in this investigation were made on a single unbleached spruce sulphite pulp which was a Canadian spruce, unbleached, quick cook, sulphite stock obtained in wet lap form from a neighboring pulp mill. After arrival at the laboratory the pulp was washed thoroughly, pressed to approximately 25 per cent oven-dry content, disintegrated by hand into large crumbs, and stored in batches in air-tight 5-gallon glass jars.

A few flocculation experiments were also made on an unbleached Douglas fir sulphite stock and an unbleached birch sulphite pulp. Both of these pulps had been cooked in the laboratory and were air-dried, containing only 6 per cent moisture. The permanganate number of the Douglas fir stock was 11.3 and that of the birch sulphite, 10.

*(To Be Concluded)*

## Lake States TAPPI Meets

The Lake States Section of the Technical Association of the Pulp and Paper Industry held its March meeting at the Conway Hotel, Appleton, Wis. on Tuesday, March 14, 1939. After the dinner, Chairman Voigtman called the meeting to order and presented the speaker of the evening, D. Manson Sutherland, president of the Sutherland Refiner Corporation. His subject was "Continuous Refining and Refiners."

Mr. Sutherland opened his speech with a historical survey of the development of beating equipment and the various types were compared in regard to their action, their theoretical differences, and their efficiency. Then, the action of discs in refining pulps was studied. The lecturer gave a brief summary of development of the design employed on the faces of the discs in the Sutherland Refiner. Slides were shown to illustrate the Sutherland Refiner, its typical installations, and methods of controlling freeness in operation of the unit.

Further data was given on the reasons for the disc design and how the modern discs were developed by fundamental research on the subject. The performance characteristics of the Sutherland Refiner on many types of stocks was given. The lecture was followed by a lively discussion on disc refining in general.

Among those present at the dinner were: D. S. Brown, August Erspamer, John H. Graff, I. H. Isenberg, C. M. Koon, T. Richard Probst, Linton Simerl, J. A. Van den Akker, and Sidney D. Wells of The Institute of Paper Chemistry; Martin L. Downs, F. X. Kreiling, and C. R. Seaborne, Kaukauna, Wis.; Winifred B. Giese, K. F. Horan, R. E. Minahan, E. A. Rafeld, Martin Van De Laanschot, and John P. Weidner of Green Bay, Wis.; Glenn Carroll, H. A. Chure, A. T. Gardner, Peter E. Jones, and Gust A. Smedlund of Combined Locks, Wis.; Jos. P. Haberman and Harold Woehler of Appleton, Wis.; Myrl N. Davis, H. A. DuBois, J. R. Fanselow, Jos. A. Folfy, Paul Grady, Russell Johnson, Jos. K. Port, J. Glenn Strieby, Edward H. Voigtman, and John C. Wollwage, Neenah, Wis.; Wm. K. Kolb, R. A. Peterson, and W. B. Pusey, Appleton, Wis.; R. C. Crain, A. J. Hayes, Robert Knowles, H. E. Nelson, C. C. Parvin, C. H. Reese, and T. J. Russell, Port Edwards, Wis.; Norman H. Foley and William S. Grimes, Menasha, Wis.; R. H. Kelly, Rothschild, Wis.; H. C. Crandall, C. W. Green, A. G. Kernin, F. G. Paulick and E. W. Peterson of Mosinee, Wis.; R. G. Knechtges, A. I. Sippola, R. G. Smith, and Edwin A. Timmerman, Green Bay, Wis.; W. H. Lucort and C. J. McMahon of Appleton, Wis.; W. A. Beisel and E. G. Heberlein, Milwaukee and L. B. Penhallow, Appleton, Wis.; H. P. Madsen, Dick Radish, and R. M. Radsch, Appleton, Wis.; Ed. P. Arpin, Jr., Neenah, Wis.; Paul Boronow, Appleton, Wis.; Arthur A. Coffin, New York City; H. H. Gottsleben, Appleton, Wis.; J. W. Grimes, Neenah, Wis.; John D. Henderson, Chicago, Ill.; Tom Ireland, Chicago, Ill.; E. C. Jacobi, New York, N. Y.; G. H. Krohn, Milwaukee, Wis.; Jos. Krysiak, Menasha, Wis.; Stephen Kukolich, Neenah, Wis.; L. J. McNamara, Rothschild, Wis.; C. W. Morden, Portland, Oregon; L. A. Moss, Stevens Point, Wis.; A. W. Neubauer, Chicago, Ill.; Harold C. Olson, Milwaukee, Wis.; P. A. Paulson, Consulting Engineer, Appleton, Wis.; Carl F. Richter, Watertown, N. Y.; Ralph L. Shaw, Milwaukee, Wis.; W. D. Staley, Chicago, Ill.; D. Manson Sutherland, Trenton, N. J.; C. R. Sweet, Chicago, Ill.; Geo. A. Thompson, Jr., Holyoke, Mass.; Herbert Wenberg, De Pere, Wis.; H. O. Ware, James E. Watson, Appleton, Wis.

## Chemical by Glyco

The Glyco Products Company, Inc., 148 Lafayette street, New York, has just issued the latest edition of "Chemicals by Glyco", which contains a number of additional features.

A complete index of products, formulae, and uses makes it very easy for chemists and technical workers to find any particular piece of information they are looking for. A number of new products are also described in the catalogue in addition to the complete line of esters, emulsifying agents, synthetic waxes, resins, etc., manufactured by the company.

## To Manage Cleveland Cartons

Norman F. Greenway, vice president and general manager, last week announced the appointment of John H. Fettinger as resident manager of Cleveland Cartons, 10610 Berea Road, Cleveland, Ohio, a division of Robert Gair Company, Inc. Mr. Fettinger is a thoroughly experienced folding carton manufacturer, having been with the Gair Company for twenty-five years, most recently as assistant production manager of the Company's plant at Piermont, N. Y.

## Household Papers Exhibit

L. Hyman & Sons, general paper merchants, 102 Prince street, New York, are planning to hold an exhibition of household papers in July and are interested in getting in touch with mills making new and outstanding items in household papers, in packages retailing from 10 cents to one dollar.

# Imports of Paper and Paper Stock

## Giving Manifests of New York, Boston, Philadelphia and Other Ports of Newsprint, Wrapping, Writing, Coated, Blotting, Tissue, Strawboard, Wallboard, Cigarette Papers, Sulphite, Kraft and Ground Wood Pulp.

### NEW YORK IMPORTS

WEEK ENDING MARCH 18, 1939

SUMMARY

Cigarette paper....1051 cs.
Wall paper....10 bxs.
Paper hangings....13 bls., 3 cs.
Wall board....288 bdls.
Newsprint....2603 rolls
Printing paper....43 cs.
Wrapping paper....325 rolls
Kraft paper....967 rolls, 60 bls.
Drawing paper....6 cs.
Filter compound....125 bls.
Filter mass....100 bls.
Filter paper....55 cs.
Bristol boards....1 cs.
Surface baryta coated paper....164 crates, 5 cs.
Metal covered paper....33 cs.
Basic paper....77 cs.
Decalcomania paper....2 drums, 14 cs.
Decalcomanias....52 cs.
Transfer paper....10 cs.
Tracing cloth....21 cs.
Colored paper....4 cs.
Tissue paper....17 bls., 3 cs.
Paper tubes....124 ctns., 128 cs.
Boards....75 bls.
Miscellaneous paper....2760 rolls, 440 bls., 96 cs.

CIGARETTE PAPER

Champagne Paper Corp., *Pr. Harding,* Havre, 100 cs.
De Mauduit Paper Corp., *Ile de France,* Havre, 2 cs.
Champagne Paper Corp., *Ile de France,* Havre, 381 cs.
American Tobacco Co., *Ile de France,* Havre, 364 cs.
Clark Fruitier, Co., *Ile de France,* Harve, 76 cs.
R. H. Haumer, *Ile de France,* Havre, 1 cs.
Jay Madden Corp., *Tunaholm,* Helsingfors, 127 cs.

WALL PAPER

S. K. Lonegren, *Drottningholm,* Gothenburg, 10 bxs.

PAPER HANGINGS

W. H. S. Lloyd & Co., *American Merchant,* London, 3 bls., 2 cs.
W. H. S. Lloyd & Co, *American Farmer,* London, 10 bls., 1 cs.

WALL BOARD

——, *Drottningholm,* Gothenburg, 288 bdls.

NEWSPRINT

Jay Madden Corp., *Pr. Harding,* Finland, 334 rolls.
Perkins Goodwin & Co., *St. Louis,* Hamburg, 469 rolls.
Jay Madden Corp., *Mormacsun,* Rauma, 528 rolls.
J. L. Hammett Co., *Tunaholm,* Gothenburg, 30 rolls.
Nolan Bowmall & Co., Inc., *Tunaholm,* Gothenburg, 44 rolls.
Jay Madden Corp., *Tunaholm,* Kotka, 176 rolls.
Nolan Bowmall & Co., Inc., *Drottningholm,* Gothenburg, 75 rolls.
Perkins Goodwin & Co., *Hansa,* Hamburg, 352 rolls.
Jay Madden Corp., *Hansa,* Finland, 595 rolls.

PRINTING PAPER

Senefelder Co., *St. Louis,* Hamburg, 5 cs
L. A. Consmiller, *Hansa,* Bremen, 38 cs.

WRAPPING PAPER

Jay Madden Corp., *Pr. Harding,* Finland, 254 rolls.
——, *Drottningholm,* Gothenburg, 71 rolls.

KRAFT PAPER

Arkell Safety Bag Co., *Drottningholm,* Gothenburg, 12 rolls.
——, *Drottningholm,* Gothenburg, 955 rolls, 60 bls.

DRAWING PAPER

H. Reeve Angel & Co., Inc., *American Merchant,* London, 5 cs.
Japan Paper Co., *American Farmer,* London, 1 cs.

FILTER COMPOUND

——, *Pr. Harding,* Hamburg, 125 bls.

FILTER MASS

A. W. Fenton, Co., Inc., *Hansa,* Bremen, 100 bls.

FILTER PAPER

H. Reeve Angel & Co., Inc., *American Merchant,* London, 21 cs.
S. H. Pomerance, *American Merchant,* London, 1 cs.
A. Giese & Son, *St. Louis,* Hamburg, 1 cs.
——, *St. Louis,* Hamburg, 16 cs.
H. Reeve Angel & Co., Inc., *Ausonia,* London, 15 cs.
——, *Hansa,* Hamburg, 1 cs.

BRISTOL BOARDS

Keuffel & Esser Co., *American Farmer,* London, 1 cs.

SURFACE BARYTA COATED PAPER

Dingelstedt & Co., *H. Jaspar,* Antwerp, 1 cs.
Globe Shipping Co., *St. Louis,* Hamburg, 1 cs., 88 crates.
L. A. Consmiller, *Hansa,* Bremen, 2 cs.
Globe Shipping Co., *Hansa,* Bremen, 76 crates, 1 cs.

METAL COVERED PAPER

K. Pauli Co., *St. Louis,* Hamburg, 3 cs.
K. Pauli Co., *Hansa,* Bremen, 30 cs.

BASIC PAPER

Globe Shipping Co., *Hansa,* Bremen, 77 cs.

DECALCOMANIA PAPER

B. F. Drakenfeld & Co., *Lancastria,* Liverpool, 2 drums, 10 cs. (duplex), 4 cs. (simplex).

DECALCOMANIAS

Sellers Transportation Co., *St. Louis,* Hamburg, 23 cs.
Sellers Transportation Co., *Hansa,* Hamburg, 29 cs.

TRANSFER PAPER

J. H. & G. B. Siebold, Inc., *Pr. Harding,* Hamburg, 10 cs.

TRACING CLOTH

E. Dietzgen & Co., *Lancastria,* Liverpool, 9 cs.
Keuffel & Esser Co., *Lancastria,* Liverpool, 12 cs.

COLORED PAPER

J. W. Hampton Jr., Co., *Black Condor,* Antwerp, 4 cs.

TISSUE PAPER

B. F. Drakenfeld & Co., *Lancastria,* Liverpool, 3 cs.
Jay Madden Corp., *Tunaholm,* Helsingfors, 17 bbls.

PAPER TUBES

——, *St. Louis,* Hamburg, 118 cs.
——, *Hansa,* Bremen, 124 ctns., 10 cs.

BOARDS

Miller Paper Co., *Tunaholm,* Gothenburg, 75 bls.

MISCELLANEOUS PAPER

Japan Paper Co., *Peter Maersk,* Kobe, 41 cs.
Remington Rand, Inc., *Peter Maersk,* Kobe, 6 cs.
——, *Ile de France,* Havre, 8 cs.
Pitt & Scott, *Ile de France,* Havre, 1 cs.
Rohner Gehrig & Co., *Ile de France,* Havre, 5 cs.
The Borregaard Co., Inc., *Drottningholm,* Gothenburg, 2679 rolls, 440 bls.
F. L. Kramer & Co., *Drottningholm,* Gothenburg, 46 rolls.
E. H. Sergent & Co., *Drottningholm,* Gothenburg, 12 cs.
Keuffel & Esser Co., *Hansa,* Hamburg, 32 rolls, 23 cs.

RAGS, BAGGINGS, ETC.

Chase National Bank, *Rodina,* Murmansk, 234 bls. linen thread waste, 607 bls. linen rags, 517 bls. flaxwaste.
Victory Shipping Co., *Ragnhild,* London, 30 bags waste paper.
W. Steck & Co., *Ragnhild,* London, 69 bls. waste string.
Darmstadt Scott & Courtney, *Ragnhild,* London, 221 bls. jute waste.
Public National Bank Trust Co., *American Merchant,* London, 16 bls. rags.
W. Steck & Co., *Nordfarer, Buenos* Ayres, 71 bls. rags.
Chase National Bank, *Caledonia,* Glasgow, 73 bls. bagging.
G. W. Millar & Co., Inc., *Zaandam,* Rotterdam, 39 bls. bagging.
W. Steck & Co., *Black Condor,* Antwerp, 310 bls. flaxwaste.
——, *Excello,* Tunis, 240 bls. rags.

R. Blank, *Excello,* Alexandria, 261 bls. rags, 372 bls. old cottons.
———, *Excello,* Alexandria, 257 bls. bagging, 647 bls. rags.
W. Steck & Co., *Excello,* Alexandria, 591 bls. rags.
Irving Trust Co., *Excello,* Alexandria, 41 bls. old canvas, 56 bls. bagging.
E. J. Keller Co., *Excello,* ———, 178 bls. rags, 90 bls. bagging.
———, *Lancastria,* Liverpool, 140 bls. rags.
J. Cohen & Son Co., Inc., *Lancastria,* Liverpool, 16 bls. paperstock.
Manufacturers Trust Co., *Lancastria,* Liverpool, 47 bls. rags, 70 bls. thread waste, 12 bls. scrap cloth.
Stone Klous & Co., Inc., *Tunaholm,* Gothenburg, 8 bls. rags.
National City Bank, *Tunaholm,* Gothenburg, 5 bls. rags.
———, *Exeter,* Tel-a-viv, 230 bls. rags.
E. J. Keller Co., Inc., *Exeter,* ———, 331 bls. rags, 73 bls. bagging.
R. Blank, *Exeter,* Alexandria, 134 bls. colored cottons.
W. Steck & Co., *Exeter,* Alexandria, 20 bls. bagging.
———, *Exeter,* Alexandria, 82 bls. rags, 58 bls. bagging.
D. S. Stern, *Pr. Harrison,* Bombay, 100 bls. cotton waste.
Chemical National Bank, *Pr. Harrison,* Bombay, 100 bls. cotton waste.
Bank of The Manhattan Co., *Pr. Harrison,* Bombay, 100 bls. cotton waste.

BONE GLUE

———, *Hansa,* Hamburg, 50 bags (sheets).

OLD ROPE

———, *Bassano,* Newcastle, 54 bls.
National City Bank, *Caledonia,* Glasgow, 50 coils.
W. Steck & Co., *Zaandam,* Rotterdam, 31 coils.

WOOD PULP

Bulkley Dunton Pulp Co., Inc., *Braheholm,* ———, 125 bls. dry sulphite.
Stora Kopparberg Corp., *Braheholm,* Gefle, 500 bls. dry wood pulp.
Perkins Goodwin & Co., *Braheholm,* Gefle, 10 bls. dry sulphate.
Pulp Sales Corp., *Braheholm,* Kasko, 1,500 bls. sulphite, 1,610 bls. sulphate.
Pulp Sales Corp., *Braheholm,* Rauma, 170 bls. bleached sulphite.
Castle & Overton, Inc., *Pr. Harding,* Hamburg, 171 bls. wood pulp, 25 tons.
A. Giese & Son, *Zaandam,* Rotterdam, 50 bls. wood pulp.
Pulp Sales Corp., *Mormacsun,* Kasko, 12,825 bls. sulphate, 2,324 tons.
Castle & Overton, Inc., *St. Louis,* Hamburg, 685 bls. wood pulp, 137 tons.
Pulp Sales Corp., *Tunaholm,* Kotka, 400 bls. sulphite, 216 bls. kraft sulphate.
Castle & Overton, Inc., *Tunaholm,* Kotka, 1,701 bls. dry unbleached wood pulp.
M. Sone, *Tunaholm,* Stockholm, 300 bls. mechanical pulp.
Perkins Goodwin & Co., *Tunaholm,* Gothenburg, 279 bls. sulphate.
Bulkley Dunton Pulp Co., Inc., *Tunaholm,* Gothenburg, 1,200 bls. sulphite.
M. Sone, *Maria,* Trieste, 1,414 bls. wood pulp.
Bankers Trust Co., *Maria,* Trieste, 702 bls. wood pulp.

WOOD PULP BOARDS

———, *Tunaholm,* Kotka, 100 rolls.
H. Fuchs & Son, *Tunaholm,* Gothenburg, 37 crates.
Salwen Paper Co., *Drottningholm,* Gothenburg, 22 bls.
H. Fuchs & Son, *Drottningholm,* Gothenburg, 53 crates.
Fibre Case & Novelty Co., *Drottningholm,* Gothenburg, 14 bls.

## PORTLAND IMPORTS

WEEK ENDING MARCH 18, 1939

Stora Kopparberg Corp., *Braheholm,* Gefle, 530 bls. dry wood pulp.
Pulp Sales Corp., *Braheholm,* Kasko, 5,555 bls. sulphate, 750 bls. knotter pulp.
Pulp Sales Corp., *Braheholm,* Rauma, 532 bls. wood pulp, 461 bls. sulphate, 6,010 bls. sulphite.
M. Sone, *Hallaren,* Gothenburg, 623 bls. wood pulp.

## BOSTON IMPORTS

WEEK ENDING MARCH 18, 1939

Stora Kopparberg Corp., *Braheholm,* Gefle, 4,770 bls. dry wood pulp.
Tradesmans Natl Bank Trust Co., *Braheholm,* Gefle, 500 bls. dry sulphate.
Pulp Sales Corp., *Braheholm,* Kasko, 2,214 bls. sulphite, 3,280 bls. sulphate.
Castle & Overton, Inc., *Braheholm,* Hango, 1,146 bls. bleached sulphite.
Pulp Sales Corp., *Braheholm,* Hango, 348 bls. bleached sulphate, 1,689 bls. bleached sulphite.
Jay Madden Corp., *Braheholm,* Hango, 139 bls. wood pulp boards.
H. Reeve Angel & Co., Inc., *Braheholm,* Hango, 117 rolls newsprint.
New England Newspaper Publishing Co., *Braheholm,* Hango, 283 rolls newsprint.
Jay Madden Corp., *Braheholm,* Hango, 550 rolls newsprint.
———, *Black Hawk,* Rotterdam, 40 bls. rags, 182 bls. picker waste.
E. J. Keller Co., Inc., *Black Hawk,* ———, 96 bls. rags.
E. Butterworth & Co., Inc., *Black Hawk,* Antwerp, 137 bags glue stock, 9 bls. jute cuttings.
Beatty & Gorman, *Black Hawk,* Antwerp, 6 bls. rags.
M. Sone, *Hallaren,* Gothenburg, 157 bls. rags.

## PHILADELPHIA IMPORTS

WEEK ENDING MARCH 18, 1939

Neidich Process Co., *Tunaholm,* Helsingfors, 101 bbls. tissue paper.
Public Ledger, Inc., *Tunaholm,* Kotka, 476 rolls newsprint.
J. W. Hampton Jr., & Co., *Tunaholm,* Kotka, 90 rolls newsprint.
Parsons & Whittemore, Inc., *Tunaholm,* Gothenburg, 115 rolls newsprint.
Nolan Bowmall & Co., Inc., *Tunaholm,* Gothenburg, 36 rolls newsprint.
———, *Tunaholm,* Gothenburg, 623 bdls. wall board.
Pulp Sales Corp., *Tunaholm,* Kotka, 2,438 bls. sulphite.
M. Sone, *Tunaholm,* Gothenburg, 127 bls. wood pulp.
Perkins Goodwin & Co., *Tunaholm,* Gothenburg, 787 bls. sulphate.
Gottesman & Co., Inc., *Tunaholm,* Gothenburg, 3,381 bls. sulphite.
Bankers Trust Co., *Maria,* Trieste, 318 bls. wood pulp.

## BALTIMORE IMPORTS

WEEK ENDING MARCH 18, 1939

———, *Black Condor,* Rotterdam, 456 bls. wood pulp, 101 tons.
Congoleum Nairn Co., *Black Condor,* Rotterdam, 194 bls. rags.
Congoleum Nairn Co., *Black Condor,* Antwerp, 372 bls. rags.
Gottesman & Co., Inc., *Blankaholm,* Sweden, 340 bls. wood pulp.
Pagel Horton & Co., Inc., *Bertha Fisser,* Sweden, 1,815 bls. wood pulp.
Pulp Sales Corp., *Tunaholm,* Helsingfors, 553 bls. sulphite.
Jay Madden Corp., *Tunaholm,* Kotka, 1,109 rolls newsprint.
Pulp Sales Corp., *Tunaholm,* Kotka, 1,150 bls. wood pulp, 320 bls. sulphate.
M. Sone, *Tunaholm,* Stockholm, 300 bls. mechanical pulp.
M. Sone, *Tunaholm,* Gothenburg, 895 bls. wood pulp.
Parsons & Whittemore, Inc., *Tunaholm,* Gothenburg, 319 rolls newsprint.
Nolan Bowmall & Co., Inc., *Tunaholm,* Gothenburg, 644 rolls newsprint.
The Borregaard Co., Inc., *Tunaholm,* Gothenburg, 1,250 bls. wood pulp.
Atterbury Bros., Inc., *Tunaholm,* Gothenburg, 216 bls. chemical pulp.
Perkins Goodwin & Co., *Tunaholm,* Gothenburg, 169 bls. sulphate.
Bulkley Dunton Pulp Co. Inc., *Tunaholm,* ———, 1,200 bls. sulphite.

## NORFOLK IMPORTS

WEEK ENDING MARCH 18, 1939

E. Butterworth & Co., Inc., *Black Condor,* Antwerp, 187 bls. bagging.
Darmstadt Scott & Courtney, *Black Condor,* Antwerp, 54 bls. bagging.
Gottesman & Co., Inc., *Blankaholm,* Sweden, 1,075 bls. wood pulp.

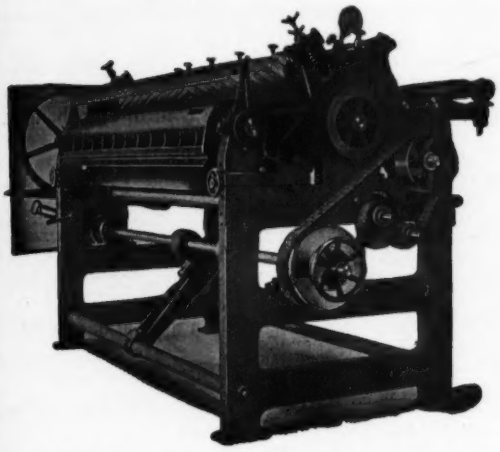
## NEW ORLEANS IMPORTS

WEEK ENDING MARCH 18, 1939

Price & Pierce, Ltd., *Aachen,* ———, 300 bls. unbleached sulphate.

MODEL 28

**ROLLER BEARING CUTTER**



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LAWRENCE, MASS.

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ENGLISH FINISH SUPERCALENDERED
MACHINE FINISHED BOOK
and LITHOGRAPHIC PAPERS

Offset, Envelope, Bond, Writing, Mimeograph, Ledger, Eggshell, Cover and Music Papers, Index Bristol, Post Card and Label Papers

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• • • •

KRAFT WRAPPING AND KRAFT ENVELOPE
KRAFT CYLINDER BOARD
BLEACHED SULPHITE AND SODA PULP
BLEACHED AND UNBLEACHED KRAFT PULP

MILLS:

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Luke, Maryland
Covington, Virginia
Tyrone, Pennsylvania
Williamsburg, Pennsylvania
Cass, West Virginia
Charleston, South Carolina

**APPLETON JORDANS**

● Advanced construction features — constant research and development—testing in actual service—all have been considered in the light of furnishing the right jordan to do the best job at the lowest operating cost.

**THE APPLETON MACHINE COMPANY · Appleton · Wisconsin**

## New York Market Review

Office of the PAPER TRADE JOURNAL,
Wednesday, March 22, 1939.

Although little change in the wholesale paper market is indicated in the reports received from the trade this week, the market continues firm and the prevailing opinion among manufacturers' representatives, jobbers, and general paper merchants continues optimistic. One large distributor reports that current business is the best in six months. The course of general business activity apparently continues upward, despite disturbing conditions abroad, and the general business prospects are sufficiently favorable to justify confidence in an improvement in business here.

The index of general business activity for the week ended March 11 remains practically unchanged at 88.0 per cent, despite the small increase in paper production. Production of over 200 paper mills for the week ended March 11 stood at 83.1 per cent, compared with 81.6 per cent for the previous week, and with 70.1 per cent for the corresponding period last year. Paper board production for a like period was 70.0 per cent, compared with 61.0 per cent for the week ended March 12 last year.

No important change in the current newsprint situation has been reported this week. The total North American production of newsprint for the first two months of 1939 was less than for the corresponding months last year, and amounted to about 409,000 tons, compared with 425,000 tons in 1938; 566,000 tons in 1937, and 450,000 in 1936. The total amount of newspaper advertising for the first two months of this year was 4.7 per cent less than for like months last year.

A general improvement is reported in practically all grades of paper for the week. Wholesale trade as a whole is of good volume, prices are firm and the practice of making price concessions, while present, is more limited than formerly. Improvement in some grades of book paper has been reported this week and conditions are viewed as encouraging for a better volume of sales in the near future. Some grades of groundwood papers are reported as more active for the current week. Production and orders of many grades of tissue papers continue at a good level, with reports of the continuance of price cutting in some quarters of the trade.

Improvement in the writing paper division of the industry is also reported as continuing. Kraft paper production continues at a good level. Paper board continues active and the market for all paper products is relatively strong with prices firm at a relatively low level.

### Mechanical Pulp

No change of importance in the market situation of mechanical pulp has been reported for the week. Demand is stated in some quarters of the trade as improving. Prices are firm and continue unchanged.

### Chemical Pulp

With reports of stocks on docks as being steadily reduced, the market situation of chemical pulp is viewed in some quarters of the trade as improving. Although some spot sales are reported at below the level of representative quoted market prices, the tonnage is reported as small and without affect on the market. Prices are unchanged on all standard grades of pulp.

### Old Rope and Bagging

Transactions in the old rope market are limited this week and this market is quiet. Prices continue firm and unchanged at prevailing market levels. A little more activity is reported in jute threads at current quotations. No change in demand or prices has been reported in old bagging this week and this market is reported in some quarters of the trade as less firm.

### Rags

The demand for a few grades of new domestic rags is reported as fair for this week. Mills are reported to be buying steadily but strictly limiting orders to immediate needs. Roofing rags continue active. Price on all grades of new and old domestic rags continue firm and unchanged at prevailing market quotations. The foreign rag market is inactive and nominal prices prevail.

### Old Waste Paper

In general, the old waste paper market continues active and prices are firm. Business is reported as good in old corrugated and all kraft grades are more firm, with the price trend probably upward. Mixed papers continue firm and a higher price level is expected in some quarters of the trade.

### Twine

The twine market continues to reflect a firmer tone. Prices on all grades of hard and soft fiber twines are reported as unchanged for the current week. The outlook is generally viewed as favorable for the near future.

---

## Motors and Pumps

The Allis-Chalmers Manufacturing Company, Milwaukee, Wis., has just issued three new leaflets. In No. 1883-A, details of construction of Lo-maintenance direct current motors and generators are described. A special leaflet, No. 2125-C, describes the company's Explosion-proof motors and shows installations in dangerous positions. Leaflet No. 2293, is descriptive of type "PO" centrifugal pumps, designed for low mtaintenance cost and for high efficiency in pumping paper stock and chemicals.

# HIGHEST QUALITY CLAYS

LUMP and POWDERED } IMPORTED — DOMESTIC { CRUDE CRUSHED, AIR FLOATED, WATER WASHED

PAPER MAKERS IMPORTING CO. INC. BOSTON, PENNSYLVANIA, U.S.A.

## PRECIPITATED CALCIUM CARBONATE

Pure Titanium Dioxide

## ZOPAQUE RG

*a New Development*

giving maximum suspension and dispersion in water, assuring high efficiency and value.

*The opacity and brightness of ZOPAQUE will produce an exceptional paper for you. . . . .*

*Try it!*

Sole Selling Agents:
The Chemical & Pigment Company
Baltimore, Md. · Collinsville, Ill. · Oakland, Calif.
Manufactured by
American Zirconium Corporation
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CAMDEN MAINE

DISTRIBUTED SINCE 1864 BY

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## MILL COGS

*LABOR SAVING—TIME SAVING*

THE MOST ECONOMICAL FILLING THAT CAN BE PUT IN A MORTISE WHEEL

Ready Dressed



Blank Head

WE MAKE ANY STYLE OR SIZE WANTED

WRITE FOR INSTRUCTION SHEET "C" WHICH IS FREE

QUICK SERVICE ON ALL SIZES
THE N. P. BOWSHER CO., South Bend, Ind.

## WATERBURY FELTS

*Are Made By*

H. WATERBURY & SONS CO.
ORISKANY, NEW YORK

# Miscellaneous Markets

Office of the PAPER TRADE JOURNAL,
Wednesday, March 22, 1939.

BLANC FIXE—Quotations on blanc fixe remain firm and unchanged at prevailing market prices. The pulp is quoted at from $42.50 to $45 per ton, in bulk; the powder is offered at from 3½ to 3¾ cents per pound, in barrels, at works.

BLEACHING POWDER—Prices on bleaching powder continue firm and conform to prevailing market quotations. Bleaching powder is quoted at from $2 to $2.25 per 100 pounds, in drums, at works.

CASEIN—The demand for casein is reported as improved for the week. Standard domestic casein, 20-30 mesh, is quoted at from 8 to 8½ cents per pound; 80-100 mesh at from 8½ to 9 cents per pound. All prices in bags, car lot quantities.

CAUSTIC SODA—Quotations on caustic soda remain unchanged at prevailing market prices. Solid caustic soda is quoted at from $2.10 to $2.30 per 100 pounds; flake and ground at from $2.50 to $2.70 per 100 pounds, in drums, at works.

CHINA CLAY—Prices on china clay continue firm and unchanged at prevailing market levels. Imported clay is quoted at from $13 to $25 per ton, ship side. Domestic filler clay is offered at from $6.50 to $12 per ton; coating clay at from $11 to $22 per ton, at mines.

CHLORINE—Quotations on chlorine are firm and unchanged at prevailing market levels. Chlorine is quoted at $1.75 per 100 pounds, in single-unit tank cars, f.o.b., works.

ROSIN—The demand for rosin is reported as improved for the week. "G" gum rosin is quoted at $5.55; "F" wood rosin at $4.38, per 280 pounds, gross weight, in barrels, at Savannah. Seventy per cent gum rosin size is quoted at $2.92 per 100 pounds, f.o.b., shipping point.

SALT CAKE—Quotations on salt cake are firm and unchanged. Prices range at from $12 to $13.50 per ton; chrome salt cake at from $11 to $12 per ton, f.o.b., shipping point. Imported salt cake is offered at from $14.50 to $15 per ton, Gulf or Atlantic Seaboard, on dock.

SODA ASH—Prices on soda ash are unchanged and conform to prevailing market levels. Quotations on soda ash in car lots, at works, per 100 pounds, are as follows: in bulk, $.90; in bags, $1.05; and in barrels, $1.35.

STARCH—Quotations on corn starch continue unchanged at prevailing market prices. Globe pearl is quoted at $2.50 per 100 pounds; special paper starch is offered at $2.60 per 100 pounds. All prices in bags, car lots, f.o.b., Chicago.

SULPHATE OF ALUMINA—Prices of sulphate of alumina are unchanged at prevailing market quotations. The commercial grades are quoted at $1.15; iron free at $1.30, per 100 pounds, in bags, car lot quantities, f.o.b., works.

SULPHUR—Quotations on sulphur are firm and conform to prevailing market prices. Annual contracts are quoted at $16 per long ton, f.o.b., mines. Spot and nearby car lots are offered at $19 per ton.

TALC—Prices on talc are firm and unchanged at prevailing market quotations. Domestic talc is quoted at from $15 to $18 per ton, Eastern mines. Imported talc is offered at from $25 to $40 per ton, on dock.

# Market Quotations

## Paper

(Delivered New York)

News, per ton—
Roll, contract....$50.00 @ —
Sheets .....58.00 @ —

Kraft—per cwt.—Delivered Zone A
No. 1 Northern....$4.75 @$5.25
Superstandard .... 4.12½ @ 4.62½
Northern Standard Wrapping ..... 4.00 @ —
Standard Wrapping 3.50 @ —

Tissues—Per Ream—Carlots
White No. 1..... .92½ @ —
White No. 1 M. G. .90 @ —
White No. 1½.... .67½ @ —
White No. 2..... .60 @ —
Anti-Tarnish M. G. .75 @ —
Colored ..... .87½ @ —
Kraft ..... .75 @ —
Manila ..... .60 @ —
Unbl. Toilet, 1 M.. 3.20 @ —
Bleached Toilet.... 5.26 @ —

Paper Towels—
Unbleached ..... 1.80 @ —
Bleached ..... 2.10 @ —

Manila—per cwt.—C. l. f. a.
No. 1 Jute..... 8.25 @ 9.75
No. 2 Jute..... 7.50 @ 9.00
No. 1 Manila Wrapping, 35 lb..... 5.00 @ —
No. 2 Manila Wrapping, 35 lb..... 4.75 @ —

Boards, per ton—
News .....27.50 @30.00
Chip .....27.50 @30.00
Sgl. Mla. Lt. Chip.42.50 @ —
Jute Lined Chip...42.50 @45.00
White Pat. Coated.55.00 @57.50
Kraft Liners.....42.50 @45.00
Binders Boards....71.00 @77.00

The following are representative of distributors' resale prices:

Rag Content Bonds and Ledgers—
White, Assorted Items,
Delivered in Zone 1:

| | Bonds | Ledgers |
|---|---|---|
| 100% Rag Ext. No. 1. | $39.10@$46.00 | $40.25@$47.25 |
| 100% Rag | 31.05@ 36.50 | 32.20@ 37.75 |
| 85% Rag | ..... | 29.90@ 35.00 |
| 75% Rag | 23.60@ 27.75 | 24.75@ 29.00 |
| 65% Rag | ..... | 21.65@ 26.25 |
| 50% Rag | 17.55@ 21.50 | 18.70@ 22.75 |
| 25% Rag | 14.65@ 17.75 | 15.80@ 19.25 |

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers—
White, Assorted Items,
Delivered in Zone 1:

| | Bonds | Ledgers |
|---|---|---|
| No. 1... | $8.60@$10.50 | $9.75@$12.00 |
| No. 2... | 7.70@ 9.50 | 8.90@ 10.75 |
| No. 3... | 6.85@ 8.25 | 8.00@ 9.75 |
| No. 4... | 6.45@ 7.75 | 7.60@ 9.25 |

Colors $1.00 cwt. extra.

Free Sheet Book Papers—
White, Cased Paper,
Delivered in Zone 1:

| | |
|---|---|
| No. 1 Glossy Coated... | $11.30@$12.75 |
| No. 2 Glossy Coated... | 9.70@ 11.00 |
| No. 3 Glossy Coated... | 8.60@ 10.00 |
| No. 4 Glossy Coated... | 8.05@ 9.25 |
| No. 1 Antique (watermarked) ..... | 8.05@ 9.25 |
| No. 2 Offset..... | 7.45@ 8.50 |
| A Grade E. F..... | 7.20@ 8.25 |
| A Grade S. & S. C.... | 7.45@ 8.50 |
| B Grade E. F..... | 6.65@ 7.75 |
| B Grade S. & S. C.... | 6.90@ 8.00 |
| C Grade E. F..... | 6.40@ 7.50 |
| C Grade S. & S. C.... | 6.65@ 7.75 |
| D Grade E. F..... | 6.10@ 7.00 |
| D Grade S. & S. C.... | 6.35@ 7.25 |

Ivory & India at $.50 cwt. extra.

## Mechanical Pulp

(On Dock, Atlantic Ports)

No. 1 Imported—
Moist .....25.00 @28.00
Dry .....25.00 @28.00

(Delivered)

No. 1 Domestic and Canadian .....29.00 @33.00

## Chemical Pulp

(On Dock, Atlantic, Gulf and West Coast Ports)

Bleached Sulphite (Domestic and Foreign)—
Prime Bleached Sulphite ..... 2.25 @ 2.75

Prime Qualities—
Easy-Bleaching Sulphite ..... 1.90 @ 2.00
Strong Unbleached Sulphite ..... 1.80 @ 1.95

(On Dock, Atlantic Ports)

Kraft Bleached..... 2.50 @ 2.75
Kraft Light & Strong 1.60 @ 1.75
Kraft No. 1..... 1.45 @ 1.60
Kraft No. 2..... 1.35 @ 1.40

(F. o. b. Pulp Mill)

Kraft Domestic..... 1.25 @ 1.75

(Delivered)

Soda Bleached..... 2.55 @ —

Add 60 cents per short ton, dock charges for Albany; $2.50 for Lake Ports East and $3.50 for Lake Ports West of Mackinac Straits.

## Domestic Rags

### New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—
New White, No. 1. 6.60 @ 6.85
Silesias No. 1..... 4.00 @ 4.25
New Unbleached... 6.50 @ 6.75
Blue Overall..... 4.90 @ 5.00
Fancy ..... 2.00 @ 2.15
Washables ..... 1.50 @ 1.60
Mixed Khaki Cuttings ..... 3.00 @ 3.25
O. D. Khaki Cuttings 4.00 @ 4.10

### Old Rags

White, No. 1—
Repacked ..... 2.90 @ 3.15
Miscellaneous ..... 2.10 @ 2.25

White, No. 2—
Repacked ..... 1.50 @ 1.60
Miscellaneous .... 1.25 @ 1.40

Thirds and Blues—
Repacked ..... 1.30 @ 1.40
Miscellaneous ..... 1.15 @ 1.20

Roofing Rags—
No. 1..... 1.05 @ 1.10
No. 2..... .75 @ .80
No. 3 (bagging).. .55 @ .65
No. 4..... .60 @ .65
No. 5A..... .60 @ .65

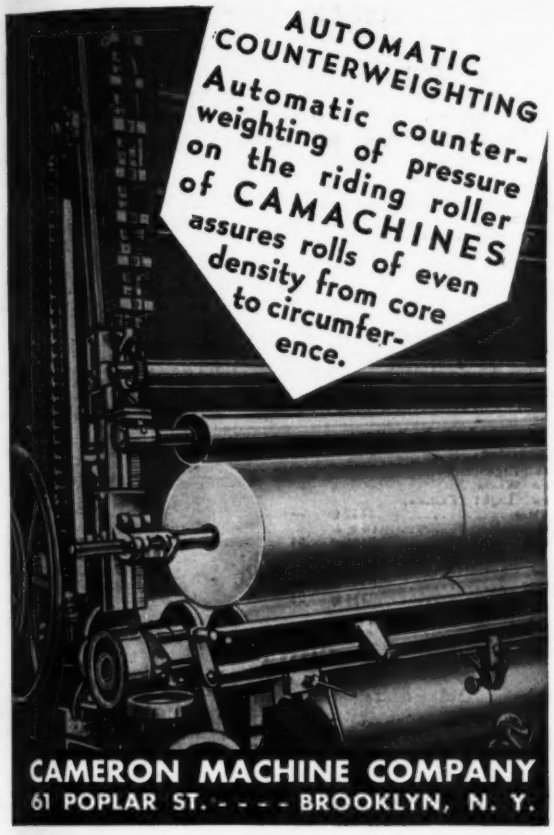
## Foreign Rags

### New Rags

New Dark Cuttings.. 2.25 @ 2.40
New Mixed Cuttings. 2.00 @ 2.20
New Light Silesias.. 5.50 @ 5.75
Light Flannelettes... 5.50 @ 5.75
New White Cuttings. 7.00 @ 7.50
New Light Oxford.. 4.00 @ 4.50
New Light Prints... 3.00 @ 3.25

### Old Rags

No. 1 White Linens. 7.50 @ 8.50
No. 2 White Linens. 6.50 @ 7.50
No. 3 White Linens. 4.50 @ —


AUTOMATIC COUNTERWEIGHTING
Automatic counter-weighting of pressure on the riding roller of CAMACHINES assures rolls of even density from core to circumfer-ence.
CAMERON MACHINE COMPANY
61 POPLAR ST. - - - - BROOKLYN, N. Y.

# THE DRAPER FELTS

All kinds and styles of Felts for all kinds and styles of Papers.

Write us about your Felt problems and let us help you reduce your Felt Costs—we will call anywhere at any time.

**DRAPER BROS. COMPANY**

CANTON, MASS.

*Woolen manufacturers since 1856*

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PAPER MAKING & PAPER FINISHING MACHINERY

Automatic and Semi Automatic Toilet Roll Wrapping Machines.
Longitudinal, Cross, and Double Crepe Machines.
Fibrofiners for groundwood, screenings and pulps.

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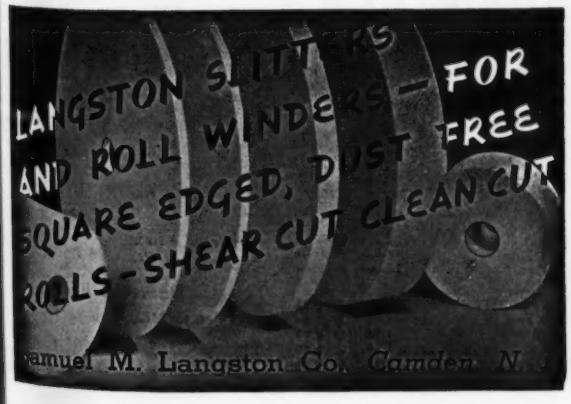
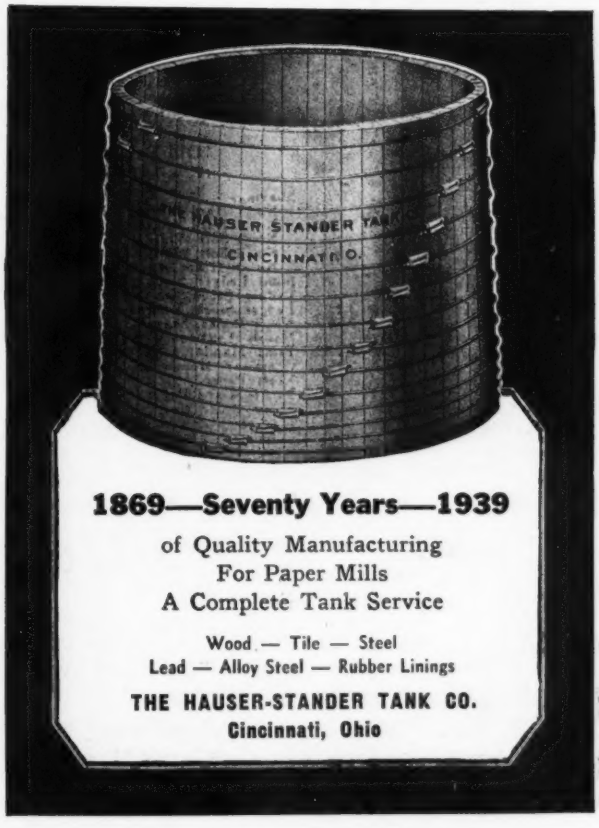
E. D. JONES & SONS COMPANY - PITTSFIELD, MASS.

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of Quality Manufacturing
For Paper Mills
A Complete Tank Service

Wood — Tile — Steel
Lead — Alloy Steel — Rubber Linings

**THE HAUSER-STANDER TANK CO.**
**Cincinnati, Ohio**

| | | | |
|---|---|---|---|
| No. 4 White Linens. | 2.25 | @ | 3.25 |
| No. 1 White Cotton. | 4.25 | @ | 4.75 |
| No. 2 White Cotton. | 3.25 | @ | 3.75 |
| No. 3 White Cotton. | 2.50 | @ | 3.00 |
| No. 4 White Cotton. | 1.90 | @ | 2.20 |
| Extra Light Prints.. | 2.00 | @ | 2.40 |
| Ord. Light Prints... | 1.75 | @ | 2.15 |
| Med. Light Prints... | 1.55 | @ | 1.95 |
| Dutch Blue Cottons. | 2.25 | @ | 2.50 |
| French Blue Linens.. | 3.00 | @ | — |
| Checks and Blues... | 2.00 | @ | — |
| Linsey Garments.... | 1.90 | @ | 2.00 |
| Dark Cottons..... | 1.50 | @ | 1.60 |
| Old Shopperies..... | 1.30 | @ | 1.45 |
| New Shopperies..... | 1.45 | @ | 1.50 |
| French Blues..... | 2.25 | @ | 2.50 |

### Old Rope and Bagging

(Prices to Mill, f. o. b. N. Y.)

| | | | |
|---|---|---|---|
| Gunny No. 1— | | | |
| Foreign ..... | 1.75 | @ | 1.90 |
| Domestic ..... | 1.70 | @ | 1.80 |
| Wool Tares, light.... | 1.60 | @ | 1.70 |
| Wool Tares, heavy... | 1.80 | @ | 1.90 |
| Bright Bagging..... | 1.60 | @ | 1.70 |
| Manila Rope— | | | |
| Foreign ..... | 2.60 | @ | 2.75 |
| Domestic ..... | 2.00 | @ | 3.00 |
| Jute Threads..... | 2.75 | @ | 3.00 |
| Sisal Strings..... | 1.50 | @ | 1.60 |
| Mixed Strings..... | .55 | @ | .60 |

### Old Waste Papers

(F. o. b. New York)

| | | | |
|---|---|---|---|
| Shavings— | | | |
| White Envelope Cuttings ..... | 2.30 | @ | 2.40 |
| Ordinary Hard White No. 1.... | 1.90 | @ | 2.00 |
| Soft White No. 1.. | 1.60 | @ | 1.75 |
| Soft White Extra.. | 2.25 | @ | 2.40 |
| Flat Stock— | | | |
| Stitchless ..... | .80 | @ | .85 |
| Overissue Mag..... | .70 | @ | .75 |
| Solid Flat Book... | .55 | @ | .60 |
| Crumbled No. 1... | .40 | @ | .45 |
| Ledger Stock White. | 1.10 | @ | 1.20 |
| Ledger Stock Colored | .60 | @ | .70 |
| New B. B. Chips.... | .15 | @ | .20 |
| Manila— | | | |
| New Env. Cut..... | 1.40 | @ | 1.50 |
| New Cuttings..... | 1.00 | @ | 1.20 |
| Old Kraft Machine— | | | |
| Compressed bales.. | .60 | @ | .65 |
| News— | | | |
| No. 1 White News | 1.25 | @ | 1.30 |
| Strictly Overissue.. | .40 | @ | .45 |
| Strictly Folded.... | .37½ | @ | .42½ |
| No. 1 Mixed Paper.. | .17½ | @ | .22½ |

### Twines

(F. o. b. Mill)

(Soft Fiber)

| | | | |
|---|---|---|---|
| Coarse Polished— | | | |
| India ..... | .12¾ | @ | .14¾ |
| White Hemp..... | .13¾ | @ | .15¾ |
| Fine Polished— | | | |
| Fine India..... | .16 | @ | .18 |
| Unpolished— | | | |
| Box ..... | .09½ | @ | — |
| Paper Makers..... | .09½ | @ | .10½ |
| Tube Rope..... | .10¾ | @ | .12½ |
| Wall Paper..... | .10¾ | @ | .12½ |
| Wrapping ..... | — | @ | — |
| Soft Fiber Rope... | .12 | @ | .14 |
| Cotton ..... | .17 | @ | .20 |
| (Hard Fiber) | | | |
| Medium Java..... | .11 | @ | .17 |
| Mex. Sisal..... | .10 | @ | .16 |
| Manila ..... | .16 | @ | .23 |

| | | | |
|---|---|---|---|
| Domestic ..... | 2.65 | @ | 2.75 |
| Sisal Rope..... | 1.75 | @ | 1.85 |
| Mixed Rope..... | .40 | @ | .50 |
| Transmission Rope... | 1.90 | @ | 2.00 |
| Soft Jute Ropes..... | 1.90 | @ | 2.00 |
| Jute Carpet Threads. | .75 | @ | .90 |
| Gunny Bagging— | | | |
| Foreign ..... | 1.65 | @ | 1.80 |
| Domestic ..... | 1.50 | @ | 1.60 |
| Bleachery Burlap... | 2.50 | @ | 3.00 |
| Scrap Burlap— | | | |
| Foreign ..... | 1.55 | @ | 1.65 |
| Domestic ..... | 1.25 | @ | 1.40 |
| Scrap Sisal..... | 1.50 | @ | 1.75 |
| Scrap Sisal for Shredding ..... | 1.75 | @ | 2.00 |
| Wool Tares, Heavy.. | 1.50 | @ | 1.60 |
| New Burlap Cuttings | 2.00 | @ | 2.25 |
| Aust. Wool Pouches. | 2.50 | @ | 2.75 |
| Heavy baling bagging | 1.70 | @ | 1.85 |
| Paper Mill Bagging.. | 1.00 | @ | 1.15 |
| No. 2 Bagging..... | .50 | @ | .70 |

### Domestic Rags (New)

(F. o. b. Boston)

| | | | |
|---|---|---|---|
| Shirt Cuttings— | | | |
| New Light Prints... | .03¼ | @ | .03½ |
| New White No. 1... | .06¾ | @ | .07 |
| New Light Flannelettes ..... | .04¾ | @ | — |
| Silesias No. 1..... | .04¾ | @ | — |
| New Black Silesias.. | .03¾ | @ | .04 |
| Soft Unbleached..... | 6.50 | @ | 7.00 |
| Blue Cheviots..... | .05 | @ | .05¼ |
| Fancy ..... | .03 | @ | .03¼ |
| Washable ..... | .02¾ | @ | .03 |

| | | | |
|---|---|---|---|
| Cottons—According to grades— | | | |
| Blue Overalls..... | .04¾ | @ | .05 |
| New Black, soft... | .03¾ | @ | .04 |
| Khaki Cuttings..... | .03 | @ | .03½ |
| O. D. Khaki..... | .04 | @ | — |
| Corduroy ..... | .02¾ | @ | .03 |
| New Canvas..... | .06¾ | @ | .07½ |
| B. V. D. Cuttings... | .06¾ | @ | — |

### Domestic Rags (Old)

(F. o. b. Boston)

| | | | |
|---|---|---|---|
| Canvas ..... | .04½ | @ | — |
| White No. 1— | | | |
| Repacked ..... | — | @ | 2.71 |
| Miscellaneous ..... | 2.50 | @ | 2.71 |
| White No. 2— | | | |
| Repacked ..... | 1.90 | @ | 2.00 |
| Miscellaneous ..... | 2.00 | @ | 2.25 |
| Twos and Blues..... | 1.75 | @ | 2.00 |
| Old Blue Overalls... | 1.50 | @ | — |
| Thirds and Blues— | | | |
| Repacked ..... | 1.37½ | @ | 1.75 |
| Miscellaneous ..... | 1.25 | @ | 1.65½ |
| Black Stockings..... | 3.90 | @ | 4.00 |
| Roofing Stock— | | | |
| No. 1..... | 1.00 | @ | 1.10 |
| No. 2..... | .75 | @ | .81 |
| No. 3..... | .65 | @ | .70 |

### Foreign Rags

(F. o. b. Boston)

| | | | |
|---|---|---|---|
| Dark Cottons..... | .95 | @ | 1.05 |
| Dutch Blues..... | 2.65 | @ | 2.75 |
| New Checks and Blues | 2.85 | @ | 3.00 |
| Old Fustians..... | 2.25 | @ | 2.50 |
| Old Linsey Garments | 2.20 | @ | 2.25 |
| New Silesias..... | 3.75 | @ | 4.00 |

## PHILADELPHIA

### Domestic Rags (New)

(Price to Mill, f. o. b. Phila.)

| | | | |
|---|---|---|---|
| Shirt Cuttings— | | | |
| New White, No. 1. | .06½ | @ | .07 |
| New White, No. 2. | .03½ | @ | .04 |
| Light Silesias..... | .03½ | @ | .04 |
| Silesias, No. 1.... | — | @ | .04½ |
| Black Silesias, soft | — | @ | .03 |
| New Unbleached.. | .05½ | @ | .06 |
| Washable, No. 1.. | .01½ | @ | .01¾ |
| Blue Overall..... | .04 | @ | .04½ |
| Cottons—Acording to grades— | | | |
| Washable No. 2... | .01 | @ | .01¾ |
| New Blue..... | .01 | @ | .01¾ |
| Fancy Percales.... | — | @ | .02½ |
| New Black Soft... | .03 | @ | .03½ |
| New Light Seconds | — | @ | .04½ |
| New Dark Seconds | .50 | @ | .75 |
| Khaki Cuttings— | | | |
| No. 1 O. D..... | .03 | @ | .03½ |
| No. 2 Mixed..... | .02 | @ | .02½ |
| Corduroy ..... | — | @ | .02 |
| New Canvas..... | .05 | @ | .05½ |
| New Black Mixed. | .02½ | @ | .02¾ |

### Domestic Rags (Old)

| | | | |
|---|---|---|---|
| White No. 1— | | | |
| Repacked ..... | 3.00 | @ | 3.25 |
| Miscellaneous .... | 2.50 | @ | 2.75 |
| Thirds and Blues— | | | |
| Miscellaneous ..... | 1.00 | @ | 1.25 |
| Repacked ..... | 1.50 | @ | 1.75 |
| Black Stockings (Export) ..... | 3.00 | @ | 3.50 |
| Roofing Stock— | | | |
| Foreign No. 1.... | — | @ | 1.10 |
| Domestic No. 1... | — | @ | 1.00 |
| Domestic No. 2... | — | @ | .75 |
| Roofing Bagging.. | — | @ | .65 |

### Bagging

(F. o. b. Phila.)

| | | | |
|---|---|---|---|
| Gunny, No. 1— | | | |
| Foreign ..... | 1.75 | @ | 2.00 |
| Domestic ..... | 1.50 | @ | 1.75 |
| Manila Rope..... | — | @ | 3.50 |
| Sisal Rope..... | 1.50 | @ | 1.75 |
| Mixed Rope..... | .75 | @ | 1.00 |
| Scrap— | | | |
| No. 1..... | — | @ | 1.75 |
| No. 2..... | 1.00 | @ | 1.25 |
| Wool Tares, heavy.. | 3.25 | @ | 3.50 |
| Mixed Strings..... | .75 | @ | 1.00 |
| No. 1 New Light Burlap ..... | 2.50 | @ | 3.00 |
| New Burlap Cuttings | 1.75 | @ | 2.00 |

### Old Papers

(F. o. b. Phila.)

| | | | |
|---|---|---|---|
| Shavings— | | | |
| No. 1 Hard White. | 2.25 | @ | 2.30 |
| No. 2 Hard White. | 1.90 | @ | 2.00 |
| No. 1 Soft White.. | 1.75 | @ | 1.80 |
| No. 2 Soft White.. | 1.30 | @ | 1.40 |
| No. 1 Mixed..... | .65 | @ | .75 |
| Solid Ledger Stock.. | 1.45 | @ | 1.50 |
| Ledger Stock, white. | 1.15 | @ | 1.20 |
| Ledger Stock, colored | .75 | @ | .80 |
| No. 1 Books, heavy.. | .60 | @ | .75 |
| Manila Cuttings..... | 1.45 | @ | 1.50 |
| Print Manila..... | .45 | @ | .50 |
| Container Manila.... | .35 | @ | .40 |
| Kraft Paper..... | .75 | @ | .80 |
| No. 1 Mixed Paper.. | .22½ | @ | .27½ |
| Straw Board Chip... | .25 | @ | .30 |
| Binders Board Chip. | .25 | @ | .30 |
| Corrugated Board... | .50 | @ | .55 |
| Overissue News..... | .40 | @ | .45 |
| Old Newspapers..... | .35 | @ | .40 |

## BOSTON

### Old Papers

(F. o. b. Boston)

| | | | |
|---|---|---|---|
| Shavings— | | | |
| No. 1 Hard White | 2.25 | @ | 2.50 |
| No. 1 Soft White.. | 1.85 | @ | 2.15 |
| No. 2 Mixed..... | .75 | @ | .80 |
| Solid Ledger Books.. | 1.30 | @ | — |
| Overissue Ledger Stock ..... | 1.30 | @ | 1.50 |
| Mixed Ledgers..... | .85 | @ | .90 |
| No. 1 Books, heavy.. | .65 | @ | .75 |
| No. 1 Books, light... | .65 | @ | .75 |
| Crumpled Stitchless Book Stock..... | .55 | @ | .65 |
| Manila Env. Cuttings | 1.70 | @ | 1.85 |
| Manila Envelope Cuttings, Extra Quality | 1.90 | @ | 2.00 |
| No. 1 Old Manila... | .65 | @ | .65 |
| No. 1 Old Manila... | .80 | @ | .90 |
| White Blank News.. | 1.30 | @ | 1.40 |
| No. 1 Kraft..... | .80 | @ | .85 |
| Mixed Papers..... | .15 | @ | .17½ |
| Print Manila..... | .45 | @ | .55 |
| Container Manilas... | .27½ | @ | — |
| Old Newspapers..... | .25 | @ | .32½ |
| Paper Wool Strings.. | .50 | @ | .65 |
| Overissue News..... | .45 | @ | .50 |
| Box Board Chips.... | .20 | @ | .25 |
| Corrugated Boxes.... | .30 | @ | .35 |
| Kraft corrugated boxes | .60 | @ | .75 |
| Screening Wrappers.. | .40 | @ | .45 |

### Bagging

(F. o. b. Boston)

| | | | |
|---|---|---|---|
| Manila Rope— | | | |
| Foreign ..... | 2.65 | @ | 2.75 |

## CHICAGO

### Old Papers

(F. o. b. Chicago)

| | | | |
|---|---|---|---|
| Shavings— | | | |
| No. 1 White Envelope Cuttings.... | 1.80 | @ | 1.90 |
| No. 1 Hard White. | 1.70 | @ | 1.80 |
| No. 1 Soft White.. | 1.50 | @ | — |
| Ledger & Writings.. | .75 | @ | .80 |
| Solid Books..... | .45 | @ | .50 |
| Blanks ..... | .90 | @ | — |
| Krafts ..... | .45 | @ | .50 |
| New Kraft Cuts..... | 1.10 | @ | — |
| Manila Env. Cuts... | Nominal | | |
| Ex. No. 1 Manila... | Nominal | | |
| Print Manila..... | Nominal | | |
| Overissue News..... | .35 | @ | — |
| Old Newspapers— | | | |
| No. 1 Folded News | .25 | @ | .30 |
| No. 1 Mixed Paper | .15 | @ | .20 |
| Roofing Stocks— | | | |
| No. 1..... | 1.00 | @ | 1.05 |
| No. 2..... | .85 | @ | — |

## TORONTO

### Paper

### Bonds

Direct mill shipment in two-ton lots

| | | | |
|---|---|---|---|
| No. 1 White ..... | $35.50 | @ | — |
| No. 1 Tints ..... | 36.50 | @ | — |
| No. 2 White ..... | 25.50 | @ | — |
| No. 2 Tints ..... | 26.50 | @ | — |
| No. 2 Golden Rod.. | 27.50 | @ | — |
| No. 3 White ..... | 21.00 | @ | — |
| No. 4 White ..... | 15.00 | @ | — |
| No. 4 Tints ..... | 16.00 | @ | — |
| No. 4 Golden Rod.. | 17.00 | @ | — |
| Direct mill shipment in three-ton lots | | | |
| No. 5 White ..... | $10.50 | @ | — |
| No. 5 Tints ..... | 11.50 | @ | — |
| No. 5 Golden Rod.. | 12.00 | @ | — |
| No. 6 White ..... | 9.00 | @ | — |
| No. 6 Tints ..... | 9.50 | @ | — |
| No. 6 Golden Rod.. | 11.00 | @ | — |
| No. 7 White ..... | 8.00 | @ | — |
| No. 7 Tints ..... | 8.50 | @ | — |
| No. 7 Golden Rod.. | 10.00 | @ | — |
| Book— | | | |
| No. 1 M. F. ..... | $7.00 | @ | — |
| No. 2 M. F. ..... | 6.50 | @ | — |
| No. 3 M. F. ..... | 5.25 | @ | — |
| No. 1 S. C. ..... | 7.25 | @ | — |
| No. 2 S. C. ..... | 6.75 | @ | — |
| No. 3 S. C. ..... | 5.75 | @ | — |

### Coated Book & Litho

Ton Lots (resale)

| | | | |
|---|---|---|---|
| No. 1 ..... | $12.00 | @ | — |
| No. 2 ..... | 10.25 | @ | — |
| No. 3 ..... | 8.90 | @ | — |
| Coated tinted ..... | 13.00 | @ | — |
| Wrapping—delivered— | | | |
| Rag Brown..... | 4.85 | @ | 5.25 |
| White Wrap..... | 4.00 | @ | — |
| "B" Manila..... | 4.90 | @ | 6.15 |
| No. 1 Manila..... | 5.50 | @ | 6.90 |
| Fiber ..... | 5.50 | @ | 6.90 |
| Kraft No. 2..... | 5.50 | @ | 6.90 |

(F. o. b. Cars, Toronto)

| | | | |
|---|---|---|---|
| News per ton— | | | |
| Rolls (contract)... | 46.00 | @ | — |
| Sheets ..... | 54.00 | @ | — |

### Pulp

| | | | |
|---|---|---|---|
| Ground wood..... | 29.50 | @ | — |
| Bleached sulphite.... | 54.00 | @ | — |
| Unbleached sulphite.. | 44.00 | @ | — |
| Kraft ..... | 50.00 | @ | — |
| Soda ..... | 51.00 | @ | — |

### Old Waste Paper

(In carload lots, f. o. b. Toronto)

| | | | |
|---|---|---|---|
| Shavings— | | | |
| White Env. Cut... | 2.15 | @ | — |
| Soft White..... | 1.90 | @ | — |
| White Blk. News.. | 1.25 | @ | 1.10 |
| Book and Ledger— | | | |
| Flat Magazine and Book Stock (old) | .70 | @ | — |
| Light and Crumpled Book Stock. | .60 | @ | — |
| Ledgers and Writings ..... | 1.00 | @ | — |
| Manilas— | | | |
| New Manila Cut.. | 1.35 | @ | — |
| Printed Manilas... | .45 | @ | — |
| Kraft ... ..... | .95 | @ | — |
| News and Scrap— | | | |
| Strictly Overissue.. | .50 | @ | — |
| Strictly Folded.... | .45 | @ | — |
| No. 1 Mixed Paper.. | .30 | @ | — |

### Domestic Rags

(Price to Mills, f. o. b. Toronto)

| | | | |
|---|---|---|---|
| No. 1 White Shirt Cuttings ..... | .06½ | @ | .06¾ |
| Fancy Shirt Cuttings | .02¼ | @ | .03 |